



RAPID RIVER FISH HATCHERY

1997 BROOD YEAR REPORT



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February 2000**

IDFG 00-10

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ABSTRACT

The Rapid River Fish Hatchery (RRFH) trap operated from March 12 to September 8, 1997. From May 26 to August 29, 10,520 marked chinook *Oncorhynchus tshawytscha* were collected. Of these, 5,510 were marked and returned to the Little Salmon River to re-enter the sport fishery. After the marked fish were released, 2,310 were recaptured, including 312 that returned to the trap more than once.

This year 2,604 hatchery fish were removed from the trap and distributed directly. In all, 1,725 were killed and given to various charitable organizations; 778 were transported to other drainages to supplement wild spawning or sport fisheries; and 101 were transferred to Sawtooth Fish Hatchery (SFH).

There were 4,588 fish ponded at RRFH. This total includes 3,799 Rapid River returns and 789 received from Oxbow Fish Hatchery (OFH). The sex ratio of the 4,588 fish placed in holding was 2,124 adult males (46.29%), 2,461 females (53.64%), and 3 jacks (0.07%). After ponding, 1,501 adult broodstock (751 females and 750 adult males) were removed from the ponds, transported to other drainages, and released to supplement wild spawning. The age-class structure of the remaining 3,087 held for broodstock was 3 three-year-olds (0.10%), 3,032 four-year-olds (98.22%), and 52 five-year-olds (1.68%).

A sport fishery was opened on the Little Salmon River in 1997. The Idaho Department of Fish and Game (Department) creel census estimated 3,787 chinook caught and 2,289 marked fish harvested. Nez Perce Tribal officials reported harvest of 2,196, and Shoshone-Bannock Tribal officials reported harvest of fewer than 10. Tribal fisheries were confined to Rapid River below the hatchery trap.

Ancillary species were trapped in 1997. From June 23 to August 22, 253 unmarked chinook were trapped and released into Rapid River above the trap. The age-class composition of the unmarked component of the 1997 salmon run was no three-year-olds, 247 four-year-olds, and 6 five-year-olds. From March 26 to August 12, 56 wild and 24 hatchery steelhead *O. mykiss* were trapped. The sex ratio of the returning steelhead was 19 wild males, 37 wild females, 15 hatchery males, and 9 hatchery females. Wild steelhead were released above the trap. Hatchery-produced steelhead were released into the Little Salmon River. From June 9 to August 29, 119 bull trout *Salvelinus confluentus* were trapped and released into the Rapid River.

Prespawning mortality of the 4,588 fish placed in holding ponds was 179 adult males (3.90%), 298 females (6.50%), and one jack (0.02%), for a total of 478 fish or 10.42% of the fish held.

Spawning took place from August 18 to September 16, 1997. A total of 1,376 females were spawned, and average fecundity was 3,930 eggs/female. Eggs from 238 females (about 935,340 eggs, based on average fecundity) were culled as part of a Bacterial Kidney Disease (BKD) prevention program, which left 4,472,573 green eggs (based on mechanical count) from 1,138 females. Survival to eye-up was 4,161,769 or 93.1%. During the spawning period 1,015,496 eyed-eggs were transferred to Clearwater Fish Hatchery (CFH). The total inventory remaining at RRFH was 3,146,273 eyed-eggs. These totals include eggs from 369 females that were transferred to OFH where they were incubated to the eyed stage before being returned. On June 11, 1998, CFH returned 220,250 marked fingerlings.

Marking of brood year 1997 fingerlings at RRFH took place from June 15 through June 26, 1998. There were 3,134,835 fish adipose fin (AD) clipped, and 333,774 marked with coded-wire-tags (CWT). During February 1999, 47,851 fish were marked with passive integrated transponders (PIT) tags as part of the comparative survival study. During release, 1,500 were fitted with PIT-tags to test the detection system.

From March 15 to April 26, 1999, 3,347,283 smolts were released from RRFH. Of these, 200,000 were released into the Little Salmon River and 300,000 were released into the Snake River below Hells Canyon Dam. The remaining 2,847,283 were released into Rapid River. Survival from marking to release was 99.9%. Feed conversion was 1.40.

INTRODUCTION

Funding Source

The RRFH was constructed in 1964 by Idaho Power Company (IPC) to mitigate for the loss of spring chinook salmon through construction of Brownlee, Oxbow, and Hells Canyon dams. Mitigation mandated by the Federal Energy Regulatory Commission (FERC) required IPC to transplant a run of spring chinook salmon from the Snake River to the Salmon River Drainage and to provide funds for the annual production of three million spring chinook salmon smolts at this facility. These fish are designated for release into Rapid River and into the Snake River below Hells Canyon Dam. The RRFH is staffed and operated by the Department and funded by IPC.

Location

The RRFH is located in Idaho County seven miles southwest of Riggins, Idaho. It lies on Rapid River, a tributary of the Little Salmon River. Travel distance for salmon to the ocean is approximately 600 river-mi.

OBJECTIVES

The following are the objectives of RRFH:

1. To produce three million spring chinook salmon smolts annually. The average size is to be approximately 20 fish/pound (fpp). These fish are to be released into Rapid River and the Snake River below Hells Canyon Dam.
2. To trap and spawn adult spring chinook salmon returning to Rapid River.
3. To evaluate various strategies and techniques for rearing spring chinook salmon.
4. To provide eggs and/or fry for supplementation purposes.

FACILITY DESCRIPTION

Fish-rearing facilities at RRFH consist of 50 double vertical stack incubators, 12 outdoor concrete raceways (6-ft x 90-ft), and six earthen rearing ponds (RP) with concrete side walls: RP-1A and RP-1B (42-ft x 188-ft each), RP-2A and RP-2B (35-ft x 197-ft), and RP-2C and RP-2D (37-ft x 173-ft each). Holding facilities for adult salmon broodstock consist of one concrete holding pond (HP), HP-1 (80-ft x 25-ft), and one earthen holding pond, HP-2 (40-ft x 150-ft). These holding ponds provide space for up to 4,000 adult salmon prior to spawning. Production capacities by unit are listed in Appendix 1. Rearing space by unit is shown in Appendix 2.

The RRFH facilities include a fish trap located on Rapid River approximately 1.5 mi downstream from the hatchery. It is designed to trap and hold adult fish migrating upstream. The trap consists of a permanent wooden velocity barrier, a seven-step fish ladder, and a two-stage trap. Adult salmon can be transferred from the trap by means of an Alaska Steep Pass Ladder to a 500 gal bucket that is lifted by an overhead hoist to a 1,000 gal tank truck for transport to the hatchery. The trap facility allows unimpeded migration of anadromous and resident fish around the velocity barrier when trapping operations are not in progress.

RECOMMENDED FACILITY IMPROVEMENTS

As part of our objective to evaluate production methods, we have identified two specific areas for improvement. One relates to adult salmon handling and the other to general hygiene and disease control. Average prespawning mortality at RRFH from 1970 to 1994 was 18.3%, with holding in all ponds. Examination of prespawning mortality records shows that a sharp increase occurs after first sort and subsequent handling of the adults. Our current method of gathering fish for sorting involves netting all adult fish in a large seine each spawn day. This method causes severe handling stress twice each week during the spawning season. An improved system for crowding adult fish would reduce prespawning mortality. This approach would require modification of HP-2 to provide a better environment for holding adult salmon. The other area of improvement involves the way in which water is supplied to RP-1. All water entering RP-1 must pass through the raceways system. When fingerlings are in the raceways, RP-1 receives their effluent. This can be a sanitation problem if detritus from sweeping raceways is directed into RP-1. Direct supply to RP-1 would solve this problem however, the handling of fish waste from all rearing systems remains. This question must be addressed as the Environmental Protection Agency (EPA) reevaluates hatchery discharge permits in the near future.

WATER SUPPLY

Water Source

The Rapid River originates in Adams County and flows through an undeveloped canyon before reaching the hatchery. The drainage is protected as part of the Wild and Scenic Rivers Act. It is not subjected to perturbations, such as logging or road building. Rapid River generally provides adequate water for rearing salmon; however, the steep nature of the drainage makes it a highly variable river. Spring runoff and flash floods can be violent and carry a tremendous volume of silt into the hatchery. Specific water-measurement data are recorded by the National Forest Service but are not available for the spring of 1997 at this time. In January 1997, a record high runoff occurred during what is being called a 100-year flood. We estimate that high water during the spring of 1997 peaked at more than 1,000 ft³/s and remained high well into June. Rapid River crested several times between January and mid-June. Water temperature also varies considerably. The minimum in January 1997 was 34.5°F, and the maximum in August 1997 was 58.6°F. Pond temperatures during adult holding are shown in Appendix 3.

Water Supply

Hatchery water is obtained through one 30-in and one 24-in pipeline. A 5-ft-high wooden diversion dam provides the necessary hydraulic head. Under a state license, RRFH has specific water rights to 28 ft³/s for the hatchery facility and 18.6 ft³/s for the fish trap. This water is diverted from Rapid River and then returned after passing through the hatchery. Rearing units operate on gravitational flow. Water for the incubation system is pumped from the headrace by one of two 5600-W electric pumps. A gasoline-operated pump and a gravitational-flow filter bed provide water during electrical failures. Water quality parameters are listed in Appendix 4. Effluent is monitored according to EPA guidelines.

STAFFING

Three permanent employees: a Fish Hatchery Manager II, an Assistant Fish Hatchery Manager, and a Fish Culturist staff RRFH. Approximately five seasonal employees are hired each year. The Summer Youth Employee Training Program may provide one or two employees to help with landscape maintenance. Housing accommodations include three residences for the permanent staff and a 65-ft x 14-ft mobile home for seasonal employees.

FISH PRODUCTION

Adult Collection

Spring Chinook Salmon Returns to Rapid River

The RRFH fish trap operated from March 12 through September 8, 1997. Water conditions were very high during the steelhead run and the first half of the salmon run, but they did not inhibit fish migration. As in past years, the trapping operation was interrupted periodically for sand removal. The trap was closed from April 19 through April 21, May 10 through May 18, and May 31 through June 4, 1997. The trap was also out of operation for cleaning on June 17. These closures were due to runoff from a 100-year record snowpack that produced high water, turbidity, and debris. These conditions and the associated cleanup required closure of the trap more often than usual this year.

The first marked chinook was trapped on May 26 and the last on August 29, 1997. The first week of July marked the peak of the run. This year, 10,520 marked chinook were trapped.

Marked chinook collected for spawning purposes were transported to holding ponds at the hatchery. The large number of hatchery returns allowed trapped fish to be returned to the sport fishery in the Little Salmon River. These fish were removed from the trap, loaded onto tanker trucks, and released below the Salmon River Road Bridge at Riggins, or at the Boulder Hole Access Point just south of the confluence of Boulder Creek. All 5,183 hatchery chinook that were returned to the Little Salmon River were marked to identify recaptures. Releases at the Salmon River Road Bridge (downstream from the confluence of Rapid River) received a caudal fin punch. Fish released at the Boulder Hole Access Point (upstream from the confluence of Rapid River) received

a dorsal fin punch. Counts then showed that 2,310 fish were recaptured. The 2,310 recaptures include 312 fish that were recaptured more than once (Appendix 5). This brought the total marked chinook trapped and handled, including recaptures, to 12,830.

The RRFH fish were used to supplement sport fisheries and wild spawning in other parts of the state. A total of 778 were removed from the trap and loaded directly onto tanker trucks for release into the South Fork of the Clearwater River, Boise River, and Payette River to supplement sport fisheries. As part of an agreement with the Shoshone-Bannock Tribe, 101 (50 adult females and 51 adult males) were transferred to SFH (the eggs produced by these fish were transferred from SFH to CFH). Another 1,725 hatchery fish were removed from the trap and donated to various organizations for distribution (Appendix 6). In addition to fish transferred directly from the trap, 1,501 were removed from HP-2 for transport and release into the Selway River Drainage to supplement wild spawning. A record of adult fish transfers is shown in Appendix 7.

Data collection was complicated this year by the need to return fish to sport fisheries and distribute them to humanitarian organizations quickly and without drug treatment. Hatchery management and research staff met before the 1997 run to establish data collection standards that would meet agency needs and be feasible, given time and fish quality constraints. It was agreed that data collected for research and hatchery evaluation purposes should be collected at spawning and entered into a database.

Data collected on run timing and total numbers trapped are based on all 10,520 returns to Rapid River Trap (Appendices 8, and 9). A study to assess the genetic distinction between hatchery and wild salmon in Rapid River was started this year. Fin samples were randomly taken throughout the run from 50 unmarked and 50 marked chinook for genetic analysis. A random sample was also taken for evaluation of length–weight relationships. Over the entire run, 89 fish were measured for fork length and hypural length. Weights were measured for 30 fish from this sample. Multiple linear regression of the relation between fork length and hypural length showed a correlation (R^2) of only 0.69 for our data. Regression of weight and the cube of hypural length showed an R^2 of 0.76, and regression of weight and the cube of fork length showed an R^2 of 0.84. These values are low, but if our data are added to more data from other traps, the length–weight relation may prove informative. Raw data are shown in Appendix 10.

Trapping statistics, including fork lengths, injuries, marks, and tags, were recorded for 4,276 Rapid River returns at the trap, which includes all RRFH fish placed in holding but not all fish distributed directly from the trap. Fin clips recorded for this sample were 4,089 AD clips and 187 left ventral (LV) fin clips. Our CWT detector detected 182 CWT or 4.3% of the 4,276 fish on which complete records were kept in this subsample. The entire run of 10,520 fish trapped was scanned for CWT or PIT-tags and scrutinized for jaw-tags, visual identification (VI) tags or radio transmitters. Complete records were collected for all fish in which a tag was detected. The actual detection rate of CWT was 1.7% for the entire run. Therefore, CWT detection rates of the original subsample were biased. This type of bias is also relevant in statistics about jacks. There were 10 jacks (< 59 cm) in the 4,276 subsample; however, this represents the entire run because all jacks were recorded. Therefore, the percentage of jacks in the entire run was actually 0.10%.

There were 4,588 fish ponded. This included 3,799 Rapid River returns and 789 received from OFH. The sex ratio of these fish was 2,124 adult males, 2,461 adult females, and three jacks. This subsample included fish held for broodstock and 1,501 (750 males and 751 females) removed from HP-2 for release. Data on length frequency, age-class ratio, and sex ratio were collected from 3,087 fish held for broodstock (2,298 Rapid River and 789 Snake River returns). These data were entered into an electronic database. The sex ratio of the 3,087 broodstock was 1,374 adult

males (44.51%), 1,710 females (55.39%), and three jacks (0.10%). Polymodal analysis of length frequencies did not help with age-class determination due to the presence of only one mode. Age-class criteria were based on CWT return data from the 1995 and 1996 runs. Age-class composition of the 3,087 broodstock was three (0.10%) three-year-olds (< 59 cm), 3,032 (98.23%) four-year-olds (59–85 cm), and 52 (1.68%) five-year-olds (> 85 cm) (Appendices 11 and 12). Rescanning the 3,087 broodstock at spawning yielded 185 CWT or about 6.0%. This return was far less than the 15.15% released with CWT in 1995, although that release comprised 98% of fish returning in 1997. Reasons for the low detection rates at the trap and again after spawning are unknown but should be examined. One final note about data collection. The broodstock sample was recorded at spawning, though it included prespawning mortalities. It was from a cross-section of the entire spring chinook run although it was not formally randomized. Therefore, age and sex ratios can probably be extended to the 10,520 fish trapped.

Ancillary species were collected, recorded, and released. Unmarked chinook, unmarked steelhead and bull trout were released into Rapid River above the trap, and marked steelhead were released into the Little Salmon River about one mile above its confluence with Rapid River. Scale samples were collected from unmarked chinook and steelhead. This year a study of emigration of all species from Rapid River continued. A screw-trap was installed above the hatchery diversion dam, and trapped fish were recorded daily before being released. Hatchery personnel assisted with this project from April 2 to November 4. For more information regarding this project, contact the Department Research Office.

More marked fish returned to RRFH this year than ever before. Tag information was recorded for all fish entering the trap. To help with reading the large number of PIT-tags, the hatchery received an adult PIT-tag detector with two coils. A total of 133 PIT-tags were detected in marked Rapid River, marked Snake River, and unmarked Rapid River salmon (Appendix 13). There were 121 trapped with jaw-tags (Appendix 14). Another 46 chinook arrived at Rapid River with radio transmitters and VI tags (Appendix 15).

Injuries were documented throughout the trapping season. The subsample for injury statistics was the 4,276 Rapid River fish on which data were collected. When multiple injuries were present on the same fish, they were recorded separately. Injuries consisted of 283 nitrogen burns, 39 gill net scars, 13 gaff wounds and 204 other types of injuries (Appendix 16). This year we observed many fishhooks in trapped fish, but the actual number was not recorded.

Hells Canyon Spring Chinook Salmon Returns

Idaho Power Company personnel transported 789 chinook (788 adults and 1 jack) from the OFH trap to RRFH. Five of these were unmarked fish that returned to the trap more than once. The age-class composition and sex ratio are included above with broodstock. For more information, see the Oxbow Hatchery Spring Chinook Salmon Run Report for 1997.

Inventory of Miscellaneous Species

Unmarked chinook entered the trap from June 11 through August 22, 1997. The timing of this part of the run is shown in Appendices 9 and 17. This component of the Rapid River run included 253 adults and no jacks. The fish were measured to the nearest centimeter fork length (Appendices 12 and 18), injected with antibiotic, and then released above the trap into Rapid River. The released salmon received a caudal fin punch to identify recaptures. Age-class composition of this part of the salmon run was no three-year-olds, 247 four-year-olds (97.63%), and 6 five-year-olds (2.37%). The sex ratio was 120 males (47.43%) and 133 females (52.57%).

From March 26 through August 12, 1997, 80 adult steelhead were trapped (Appendices 19 and 20) and measured to the nearest centimeter fork length (Appendices 21 and 22). The steelhead run included 56 wild fish and 24 hatchery fish. The sex ratio was 19 wild males, 37 wild females, 15 hatchery males, and 9 hatchery females. Hatchery steelhead were transported back to the Little Salmon River and released approximately one mile upstream from its confluence with Rapid River. Wild steelhead were released into Rapid River upstream from the trap. The released steelhead received a caudal fin punch to identify recaptures.

A total of 119 bull trout were trapped from June 9 through August 29, 1997 (Appendices 23 and 24). These fish ranged in size from 27 cm to 60 cm total length (Appendices 25 and 26). Department researchers continued a study of bull trout movement this year. Hatchery personnel assisted them with implanting PIT-tags, marking, and various other aspects of their study. Further information regarding this study should be obtained from the Department Research Office. An inventory of all species trapped in 1997 is shown in Appendix 27.

Sport and Tribal Fishery

The 1997 sport fishery on the Little Salmon River was the most productive in recent history. The season extended from May 17 to July 13. The Department creel censuses estimated 3,787 chinook caught with a total harvest of 2,289. For more information regarding the sport fishery on the Little Salmon River, contact the Department McCall Sub-Region Office. Nez Perce Tribal officials reported harvest of 2,196. Shoshone-Bannock Tribal officials reported fewer than 10.

Holding and Spawning

Adult Treatments

Hatchery personnel removed fish from the trap daily and processed them on site. They were handled as little as possible and processed while the fish were immersed. All chinook placed in holding or released above the weir were anesthetized with 40 ppm MS-222, measured to the nearest cm fork length, and given an injection of Erythromycin-base injectable (Gallimycin-100) at 20 mg/kg body weight. This was administered according to veterinary extra-label usage as

prescribed by Dr. Dave Hunter at the Department Caldwell Wildlife Laboratory. Neither fish removed from the trap and released to supplement fisheries nor those donated for consumption were anesthetized or injected.

The holding period extended from May 22 to September 16, 1997. This year 3,799 marked Rapid River chinook were placed in holding ponds. An additional 789 chinook were received from OFH (788 marked and 1 unmarked). This yielded 4,588 chinook held at RRFH. From this, 1,501 Rapid River fish were removed from holding and released (Appendix 7). The remaining 3,087 were held for spawning. We continued to combine holding of the Rapid River returns with Snake River returns. Our holding pond HP-1 is concrete and provides a better environment than HP-2 does for holding prior to spawning. It also allows less stressful handling during the sorting and spawning process (see the sections entitled Recommended Facility Improvements and Prespawning Mortality). HP-1 has a capacity of 1,000 adult salmon. The 789 fish received from OFH were placed in HP-1 along with a portion of the Rapid River returns to keep the pond below capacity during the holding period. The fish received from OFH were marked with two left operculum punches to identify them for separate data gathering. These punches often healed over prior to spawning. Notations of these punches on spawning and mortality records occasionally conflicted. Therefore, they were deemed unreliable. The identification of Snake River fish in the raw data has been transferred with a caveat to our database, but the distinction is omitted from this report.

Formalin treatments were administered to both ponds three times each week from June 10 through early July. Starting July 9, treatments were increased to five days each week through September 8. Treatments consisted of precharging the pond with formalin to 170 ppm and then introducing formalin into inflow water at a rate of 170 ppm for one hour. During the holding and spawning period, water temperatures ranged from 41.9°F to 58.6°F (Appendix 3). The Walco Company hauled carcasses from holding and spawning to a landfill in Montana twice each week.

Prespawning Mortality

The combined prespawning mortality for Rapid River and Hells Canyon chinook was 478 fish or 10.42% of the 4,588 fish placed in holding. After August 29, males were not considered in prespawning mortality. The sex ratio was 179 adult males (3.90%), 298 females (6.50%), and one jack (0.02%). This mortality rate was higher than the rates for the previous two years. We believe that factors influencing this increase include holding in HP-2 and crowding with nets rather than crowd-racks. Prespawning mortality this year was less than historical levels (the average from 1970 through 1994 was 18.7%). The improvement may be due to precharging the ponds with formalin before formalin drip treatments. The fish were also in generally good condition upon arrival.

Hatchery personnel did routine necropsies of all prespawning mortalities. Causal factors for prespawning mortality are shown in Appendix 28. A profile of cumulative prespawning mortality is shown in Appendix 29. Snouts were collected from fish in which a CWT was detected and sent to the Department Fish Marking Laboratory at Lewiston, Idaho.

Salmon Spawning

In 1997, 1,376 female chinook were spawned from August 18 to September 16. The eggs from 238 females were culled as part of a disease management program. About 935,340 eggs (based on an average fecundity of 3,930 eggs/female) were culled. The remaining 1,138 females produced 4,472,573 green eggs (based on mechanical counts). Complete egg enumeration and disposition data are compiled in Appendix 30. During spawning, an additional 36 females were destroyed and their eggs rejected because they were either green or the females showed gross evidence of BKD. Each female was sampled during spawning for BKD analysis. The results of enzyme-linked immunosorbant assay (ELISA) tests are shown in Appendix 31.

Spawning followed standard procedure recommended by the Integrated Hatchery Operations Team (IHOT) for random cross of two males per female. This procedure was followed to ensure that all females were fertilized with a fertile male. Females were killed with a blow to the head. The eggs from each female were put in a colander to drain off the ovarian fluid. Then they were transferred to a bucket where they were fertilized with the milt from two males and mixed with approximately 250 ml of temperature-adjusted well water. The two jacks were included for fertilization, and no male was used more than three times. Males were given a right operculum punch to identify them as having been spawned and then returned to the holding pond. All fertilized eggs were water hardened for 30 minutes in a minimum of 100-ppm iodophore. After water-hardening, green eggs were placed in vertical stack incubators that were set to a flow rate of 6 gal/min or transported in chilled water to OFH or CFH.

Incubation

The 1997 egg take (after culling 238 females) was 4,472,573 green eggs from 1,138 females, and the average fecundity was 3,930 eggs/female. After primary pick of 310,804 bad eggs, 4,161,769 eyed-eggs remained. Eye-up was 93.1%. Eggs were incubated at a rate of one female per tray to segregate individual fish pending results of ELISA studies. After the ELISA results were received, eggs from females with an optical density (o.d.) reading of 0.40 or greater were culled and discarded. At OFH, eggs were culled to an o.d. of 0.25 or greater.

The RRFH has incubation facilities for just over 3 million eggs. Because additional incubation space was required, eggs from 369 females were transferred to OFH for incubation, where eggs from 65 females were culled. The remaining eggs were incubated to eye-up and picked. At primary pick, eggs from seven females were entirely blank. These are included in the data as primary pick. Eggs from the remaining 297 females were shipped. RRFH received eggs from 128 females, and CFH received eggs from 169 females. After eggs were transported, they were re-picked and counted before they were returned to incubators.

The CFH received eyed eggs from 160 females directly from RRFH. Of these, eggs from 33 were culled. The remaining eggs from 127 females were added to the eggs transferred from OFH for a yield of 1,015,496 eyed eggs from 296 RRFH females.

A total 3,146,273 eyed eggs were reared at RRFH after eggs were returned from OFH. These came from 3,336,167 green eggs taken from 837 females. Eye-up for this group was 94.3%, and average fecundity was 3,986 eggs/female.

Eggs reared at RRFH were shocked at 500 daily temperature units (DTU) by pouring them from the trays into water. They were picked two days later using a salt bath. A Jentsorter egg counter was used to inventory eggs. After counting, the eggs were returned to clean trays. At 1,000 DTU trays were picked again, and a third pick was performed at 1,500 DTU. All trays were rodded weekly after 300 DTU. Formalin was administered to each incubator stack at a rate of 1,667 ppm (1:600) for 15 minutes to retard external mycosis. This procedure was discontinued after each lot accumulated 800 DTU. Mycosis was controlled, and fry were ponded at approximately 1750 DTU.

Early Rearing

Fry were ponded from January 3, through April 14, 1998. The first lot was initially placed in our two indoor vats and then transferred to a raceway when the next lot reached 1750 DTU. The remaining fry were placed in nine raceways. Initially, the raceways were densely loaded to facilitate feed training. After the fish were acclimated to the raceway environment and were feeding well, the volume was increased to lower Density Indices (DI) (Piper et al. 1982) below 0.2. Initial water depth was 18 in, and flow was adjusted to 0.6 ft³/s. As the fish grew, water depth and flows were increased to a maximum depth of 35 in and flow of two ft³/s. The fingerlings remained in the raceways until marking when they were transferred to rearing ponds. The average weight at the start of marking on June 15, 1998 was 162 fish/lb (2.8 g) and ranged from 324 fish/lb to 125 fish/lb (3.6 g to 1.4 g). Average DI and Flow Index (FI) (Piper et al. 1982) were 0.48 and 1.25. Initial raceway density is shown in Appendix 32, and final raceway density is shown in Appendix 33.

Mortality during early rearing was 28,359 fish or 0.9% of the total of inventory reported at marking plus the mortality recorded prior to marking.

Final Rearing

Rearing ponds were disinfected with a chlorine bath at 200 ppm before fish were ponded. The fingerlings were transferred from raceways to ponds through 4-inch irrigation pipe. The marking crew reported that 3,134,835 fingerlings were marked and moved from June 15 through June 26, 1998. This total is an increase of 3.58% from hatchery inventory for the raceways. As in the past, hatchery inventory numbers were adjusted to the number reported marked. Initial pond loading densities are reported in Appendix 34. Fingerlings were ponded at a mean length of 2.8 in and grew to 5.3 in by release. Average DI before volitional releases began on March 18, 1999, was 0.23, and the average FI was 1.59 (Appendix 35). The maximum DI recommended by the Department is 0.30. The maximum recommended FI for O₂-saturated water at 41 °F and 2,100 ft above sea level is 2.42. These parameters were within prescribed limits.

Mortality during final rearing was 5,414 fish or 0.1% of the combined inventory of those reported at marking, those recorded as mortalities prior to marking, and those recorded as fish received from CFH. Total mortality from swim-up through release was 35,773 fish or 1.0%.

Feed Use and Conversion

A total of 253,968 lbs of feed were used for brood year 1997 fish before volitional releases began on March 18, 1999. The overall feed conversion was 1.40. Specific data on feed types and sizes are listed in Appendix 36.

Starting May 8, 1998, and continuing for 28 days, brood year 1997 fingerlings were fed 2.25% Aquamycin-100 at a rate of 2.2% body weight/day to yield a dose of 100 mg Erythromycin per 100 lbs body-weight/day. The fish received from CFH started receiving this treatment June 20, 1998.

Starting September 11, 1998, and continuing for 28 days, fingerlings were fed 4.5% Aquamycin-100 at a rate of 1.1% body-weight/day to yield a dose of 100mg Erythromycin per 100 lbs body- weight/day. Treatments, performed according to guidelines set forth in Investigational New Animal Drug protocol (INAD) number 4333, were followed by toxicity testing.

Fish Health

Portions of this section of the Rapid River Hatchery 1997 Brood Year Report are reproduced with permission from Mr. Doug Munson of the Eagle Fish Health Laboratory. A summary of Eagle Health Laboratory results for individual inspections of brood year 1997 juveniles and broodstock is shown in Appendix 37.

Diseases Encountered and Treatment

Mortalities were caused by mixed infections of *Aeromonas hydrophila* and *Flavobacterium psychrophilum*. An application of OTC-medicated feed satisfactorily controlled mortalities. Two prophylactic erythromycin-medicated feed treatments were applied to Rapid River's chinook under the provisions of a standard treatment, according to the guidelines provided by INAD 4333.

Organosomatic Index

The Organosomatic Index in this context is a measure of fish health developed as part of the Autopsy-Based Fish Health/Condition Assessment System (Goede and Houghton 1987). A summary of the fish autopsy is shown in Appendix 38.

Acute Losses

Acute losses were not experienced in these fish. Chronic losses were attributed to the bacteria mentioned in the section entitled: Diseases Encountered and Treatment.

Other Assessments

For five years, external mycosis has not been a source of mortality at this facility. Due to the control of several pathogens, *Saprolegnia* has not had the opportunity to get started and become the primary pathogen. BKD segregation and culling programs have succeeded in controlling *Renibacterium* and improving overall fish health. Reducing egg incubation densities has also improved early survival.

Future improvements in fish health should be targeted at the brood-holding stage. Improvements in brood holding would reduce mortality by reducing stress and *Renibacterium* loads.

Fish Marking

Protocol requires the adipose fin to be removed from all hatchery-reared salmon. The marking crew reported 3,134,835 fish were AD clipped. CWT were placed in 333,774. Marking occurred from June 15 to June 26, 1998. After marking, fish were sampled monthly for a quality check of AD clips. A total of 3,360 fish were sampled, and the results showed 92.2% with full clips, 2.4% without clips, and 5.4% with marginal clips.

PIT-tags were placed in 47,851 fish from February 9 through February 12, 1999. During the remainder of the final rearing period, all mortalities from RP-2B and RP-2C were scanned and PIT-tag numbers recorded. Another 1,500 were fitted with PIT tags during the last week of release to evaluate our new emigrant detection system.

Specific release information about marked fish is presented in Appendix 39. For more information regarding marking consult the Annual Release Summary of Marked Salmon and Steelhead published by the Department.

Fish Distribution

Egg Transfers

During 1997, 1,015,496 eyed-eggs from 296 females were transferred to CFH for isolated incubation and rearing. On June 11, 1998, 220,250 fingerlings were returned to RRFH at an average of 174.5 fish/lb. These fingerlings were placed in one raceway, fed Aquamycin for 28 days, and then added to the hatchery population. The remaining fish were reared by CFH and released as smolts in 1999. For more information, contact the CFH.

Fingerling Transfers

On June 30, 1998, 300 fingerlings were transferred to Great Western Chemical Corp. (GWCC) for bioassay purposes. The fish arrived at Aquatic Bioassay & Consulting Laboratories,

Inc. in California in good condition; however, nearly all jumped out of the holding facility the first day. Another 260 were given to GWCC on July 7.

Smolt Releases

The total number of smolts released from RRFH in 1999 was 3,347,283 (181,780 lbs). Of these, 200,000 (9,174 lbs) smolts were released into the Little Salmon River at Hazard Creek. Another 300,000 (13,761 lbs) smolts were released into the Snake River below Hells Canyon Dam. The remaining 2,847,283 (158,845 lbs) were released into Rapid River at the hatchery. Releases took place from March 18 through April 26, 1999. Release data are reported in Appendix 40.

Final sample counts were taken at the start of volitional smolt releases on March 15, 1999. Smolts averaged 18.4 fish/lb (24.6 g) and 5.4 in (136.4 mm) fork length. Rearing densities at the time of release are listed in Appendix 35. Based on visual observations, we estimate that about 85% of the smolts emigrated volitionally. The remaining fish were seined from the ponds. The last fish emigrated on April 26. Survival from marking to release was 99.9% (Appendix 41).

Cost of Production

The total cost of production for any specific brood year is not a straightforward calculation. At RRFH, the rearing cycle is 19 months. For any brood year, the cycle extends from September, when spawning starts, to March, nineteen months later when the smolts are released. Cost of production has been reported as the total cost incurred by IPC for the entire 19-month period. Overlap in brood year classes causes the expenditure for September through March of the first year and the expenditure for September through March of the second year to be reported twice. The result is inflated estimates of production cost. Our traditional method reports total cost for 14 of the 19-month rearing cycle in three successive brood year reports. Thus, we report inflated production cost figures because we report the total cost paid by IPC for the entire period rather than costs associated with production of a given brood year. To address this problem, IPC supplied us with total cost broken down by month (letter dated July 15, 1999, from Paul Abbott, IPC Hatchery Biologist, P.O. Box 70, Boise, Idaho). One logical approach is to prorate each month's cost by the percentage that a given brood year's fish comprise of the total hatchery inventory. In our report for brood year 1995, we proposed this prorating plan and compared total cost. The method was rational and would have resulted in reporting cost numbers only once. The resulting cost per pound was one third the cost calculated using the old method. At the March 8, 1996, IHOT evaluation meeting, we were directed to continue to use the old method since the resulting cost per pound figure for 1995 appeared inconsistent with data from previous years. We recommend a future meeting with further discussion on this concern. For now, we continue to report total cost paid by IPC for the entire period.

The total cost paid by IPC for September 1, 1997, through March 30, 1999, was US\$879,292.29. Cost of production data is listed in Appendix 42.

HISTORICAL INFORMATION

As always, we have included some archival information for context. Historic information about returns by return year is listed in Appendix 43 and by brood year in Appendix 44. Average feed and growth statistics are listed in Appendix 45. Release and transfer information is listed in Appendix 46.

ACKNOWLEDGMENTS

The crew at RRFH would like to thank Mr. Paul Abbott and the fisheries staff at IPC for their support and assistance in helping us maintain and improve the hatchery facility. We would also like to thank Department personnel who helped us during the spawning season. Our gratitude again goes to Officer Roy Kinner and other conservation officers for security at the hatchery and trapping facility. In addition, we extend our appreciation to Doug Munson and the Eagle Fish Health Lab staff for diagnostic work at the hatchery and assistance in preparing this document.

LITERATURE CITED

- Goede, R. W., and S. Houghton. 1987. ASUM: A computer program for the Autopsy-Based Fish Health/Condition Assessment System. Utah Division of Wildlife Resources Fisheries Experiment Station, 1465 West 200 North, Logan, Utah 84321.
- Piper, P. G., I. B. McElwain, L. E. Orme, J.P. McCraren, J.R. Leonard. 1982. Fish hatchery management. United States Department of the Interior Fish and Wildlife Service, Washington D.C.

APPENDICES

Appendix 1. Rapid River Hatchery production capacity.

Rearing unit	Volume	Carrying capacity
Incubators	800 Trays	3,200,000 Eggs
Raceways (12)	1,890 ft ³	3,800,000 Fry
Rearing Ponds 1	54,625 ft ³	1,000,000 Smolts
Rearing Ponds 2	92,827 ft ³	2,000,000 Smolts
Adult Holding Pond 1	12,000 ft ³	1,000 Adults
Adult Holding Pond 2	24,000 ft ³	3,000 Adults

Appendix 2. Rapid River Hatchery pond volume.

Rearing/holding area	Volume (ft ³)
Rearing pond 1A	27,496
Rearing pond 1B	27,129
Rearing pond 2A	23,858
Rearing pond 2B	22,607
Rearing pond 2C	22,468
Rearing pond 2D	23,894
Adult holding pond 1	12,000
Adult holding pond 2	24,000

Appendix 3. Rapid River Hatchery adult holding pond temperatures (°F) for 1997.

Month	Maximum	Minimum	Average	Ten-year average
May	50.0	39.2	44.4	46.6
June	52.0	43.3	48.4	50.2
July	57.0	44.1	48.9	54.3
August	58.8	50.2	53.4	55.7
September	55.6	50.5	51.3	51.4

Appendix 4. Rapid River water quality analysis.

Analyte	PQL	Result	Units
Nitrate/N	0.05	ND	Mg/L
Nitrite	0.05	ND	Mg/L
Sulfate	1	14	Mg/l
Orthophosphate	0.05	ND	Mg/L
Ammonia/N	0.5	ND	Mg/L
Alkalinity	10	74	mg/L as CaCO ₃
Hardness	10	80	mg/L as CaCO ₄
pH		7.63	
Hydrogen Sulfide	0.2	ND	Mg/L
Chlorine	0.1	ND	Mg/L
Arsenic	1	ND	Ug/L
Cadmium	1	ND	Ug/L
Chromium	1	ND	Ug/L
Mercury	1	ND	Ug/L
Lead	1	ND	Ug/L
Selenium	1	ND	Ug/L
Silver	1	ND	Ug/L
Iron	30	120	Ug/L
Zinc	1	51	Ug/L
Cooper	1	ND	Ug/L
Aldrin	0.1	ND	Ug/L
Endrin	0.1	ND	Ug/L
Dieldrin	0.1	ND	Ug/L
Heptachlor	0.1	ND	Ug/L
Chlordane	0.1	ND	Ug/L
Methoxychlor	0.1	ND	Ug/L
Lindane	0.1	ND	Ug/L
Guthion	0.1	ND	Ug/L
Malathion	0.1	ND	Ug/L

PQL = Practical Quantitation Limit

ND = not detected(< PQL)

Appendix 5. Rapid River adults released into the Little Salmon River and recaptures.

Date	Recaptures						Recruits	Total	Disposition
	1°C	1°D	2°C	2°D	3°C	3°D			
6/28							180	180	Riggins
6/29	2						223	225	Riggins
6/30	4						453	457	Riggins
6/30							70	70	Pollock
6/30							50	50	Boulder Hole
7/1	3						466	469	Riggins
7/1							130	130	Boulder Hole
7/2	19						367	386	Riggins
7/2		3					184	187	Boulder Hole
7/3	41						427	468	Riggins
7/3		1					223	224	Boulder Hole
7/3							12	12	Donated to IHAC
7/3	12						65	77	Ponded in HP-2
7/4	27						254	281	Riggins
7/4	40	3					80	123	Boulder Hole
7/4	11	1					89	101	Ponded in HP-2
7/5	167	3	6				565	741	Riggins
7/5	41	2	1				191	235	Boulder Hole
7/6	37	1	3		1		203	245	Riggins
7/6	20			1			54	75	Boulder Hole
7/6	5						15	20	Donated to IHAC
7/7	56	1	1				180	238	Riggins
7/7	27	1	1				91	120	Boulder Hole
7/7	19	4	6				69	98	Donated to WICAP
7/8	70	5	9		1		243	328	Riggins
7/8	58	2	6				138	204	Boulder Hole
7/8	1						68	69	Donated to IHAC
7/9	72		20				155	247	Riggins
7/9	55	7	17				122	201	Boulder Hole
7/10							234	234	Riggins
7/10							80	80	Boulder Hole
7/10	146						32	178	Nez Perce Tribe
7/10	129						0	129	Donated to WICAP
7/11	34	1	6				91	132	Riggins
7/11	21	1	2				56	80	Boulder Hole
7/11	100						87	187	Donated to MFSFB
7/12	49						50	99	Newsome Cr.
7/12	25						26	51	Donated to IHAC

Appendix 5. (Continued).

Date	Recaptures						Recruits	Total	Disposition
	1°C	1°D	2°C	2°D	3°C	3°D			
7/14	25	2	4				?	60	Shoshone Bannock Tribe
7/15	32						34	66	Sawtooth Hatchery
7/15	71						73	144	Ponded in HP-1
7/16	57	1	5				38	101	Mill Cr.
7/16	66	1	14		3		97	181	Newsome Cr.
7/17	102	9	12	1	2		186	312	Donated to IHAC
7/17	2						4	6	Donated to IHAC
7/18	38	3	6	2			66	115	Donated to IHAC
7/21	39	13	4	1			145	202	Donated to NOISE
7/22	51	10	7				64	132	Donated to IHAC
7/23	23	5	9	2			56	95	Ponded in HP-2
7/25	51	9	5				66	131	Boise River
7/25	12	2	1				15	30	Payette River
7/25	4	1					6	11	IPC
7/28	35	13	8	2			74	132	Boise River
7/28	6	1						7	IPC
7/31	12	0	1				22	35	Transfer to Sawtooth
8/1	19	11	1				61	92	71 fish ponded
8/1							20	20	20 fish to Boise
8/1							1	1	IPC
8/4	17	6	2				45	70	Shoshone Bannock Tribe
8/8	16	5	3				60	84	Donated to IHAC
8/8							1	1	Fish to Boise
8/8							1	1	Trap mort
8/12	7	2					24	33	Ponded in HP-2
8/15	1	1					4	6	Ponded in HP-2
8/20	18	5					22	45	Ponded in HP-2
8/22	1						14	15	Ponded in HP-2
8/26	1						6	7	Ponded in HP-2
8/29	1						3	4	Ponded in HP-2
Total	1998	136	160	9	7	0	7260	9570	

C = Caudal fin punch released downstream from confluence of Rapid River and Little Salmon.

D = Dorsal fin punch released upstream from confluence of Rapid River and Little Salmon.

1°, 2°, 3° = First, second, or third time of recapture.

Recruit = First time at trap, i.e., not a recapture.

Appendix 6. Adult salmon donated to Idaho institutions.

Date	Number of fish	Name of group
7/3	12	Idaho Hunger Action Council, Riggins
7/6	20	Idaho Hunger Action Council, Riggins
7/7	98	Western Idaho Community Action Program, McCall
7/8	69	Idaho Hunger Action Council, Grangeville
7/10	178	Nez Perce Tribe
7/10	129	Western Idaho Community Action Program, McCall
7/11	187	Middleton Family Service Food Bank
7/12	51	Idaho Hunger Action Council, Orofino
7/14	60	Shoshone Bannock Tribe
7/17	312	Idaho Hunger Action Counsel, Orofino
7/17	6	Idaho Hunger Action Counsel, Riggins
7/18	115	Idaho Hunger Action Counsel, Lewiston
7/21	202	New Opportunities for Idahoans through Self Empowerment
7/22	132	Idaho Hunger Action Counsel, Orofino
8/4	70	Shoshone Bannock Tribe
8/8	84	Idaho Hunger Action Counsel, Orofino
Total	1725	

Appendix 7. Rapid River Fish Hatchery adult chinook released outside the Little Salmon River Drainage.

Date	Department catalog number	Stream	County	Region	Number of fish	Weight (kg)	Actual Site	Remarks
7/12/97	0619400000	Newsome Cr.	Idaho	2	99	539	Scatter	Rapid River Broodstock Removed From Trap
7/13/97	0619200000	Meadow Cr.	Idaho	2	104	566	Scatter	Rapid River Broodstock Removed From Trap
7/15/97	0700080000	Sawtooth Hatchery	Custer	7	66	359	Sawtooth Hatchery	Rapid River Broodstock Removed From Trap
7/16/97	0619210000	Mill Creek	Idaho	2	101	550	Scatter	50 Females And 16 Males Transferred Rapid River Broodstock Removed From Trap
7/16/97	0619400000	Newsome Cr.	Idaho	2	181	985	Scatter	Rapid River Broodstock Removed From Trap
7/25/97	0900010000	Payette River	Gem	3	30	163	Plaza Road Bridge	Rapid River Broodstock Removed From Trap
7/25/97	1000040000	Boise River	Ada	3	131	713	Scatter In Boise	Rapid River Broodstock Removed From Trap
7/28/97	1000040000	Boise River	Ada	3	132	718	Scatter In Boise	Rapid River Broodstock Removed From Trap
7/31/97	0700080000	Sawtooth Hatchery	Custer	7	35	191	Sawtooth Hatchery	Rapid River Broodstock Removed From Trap
8/25/97	0618150023	Meadow Cr.	Idaho	2	151	822	Above Weir	35 Males Transferred 75 Males & 76 Females From Holding Pond 2
8/25/97	0618150023	Meadow Cr.	Idaho	2	150	816	Above Weir	75 Males & 75 Females From Holding Pond 2
8/26/97	0618150023	Meadow Cr.	Idaho	2	150	816	End Of Road	75 Males & 75 Females From Holding Pond 2
8/26/97	0618150023	Meadow Cr.	Idaho	2	150	816	End Of Road	75 Males & 75 Females From Holding Pond 2
8/27/97	0618150000	Selway River	Idaho	2	200	1089	Above Fenn Ranger Station	100 Males & 100 Females From Holding Pond 2
8/27/97	0618150000	Selway River	Idaho	2	100	544	Above Fenn Ranger Station	50 Males & 50 Females From Holding Pond 2
8/27/97	0618150000	Selway River	Idaho	2	100	544	Above Fenn Ranger Station	50 Males & 50 Females From Holding Pond 2
8/28/97	0618150000	Selway River	Idaho	2	200	1089	Above Fenn Ranger Station	100 Males & 100 Females From Holding Pond 2
9/2/97	0618150000	Selway River	Idaho	2	150	816	Below Magruder Ranger Station	75 Males & 75 Females From Holding Pond 2
9/2/97	0618150000	Selway River	Idaho	2	132	718	Below Magruder Ranger Station	66 Males & 66 Females From Holding Pond 2
9/2/97	0618150078	Deep Cr.	Idaho	2	18	98	Above Mouth	9 Males & 9 Females From Holding Pond 2
TOTAL					2380	12952		

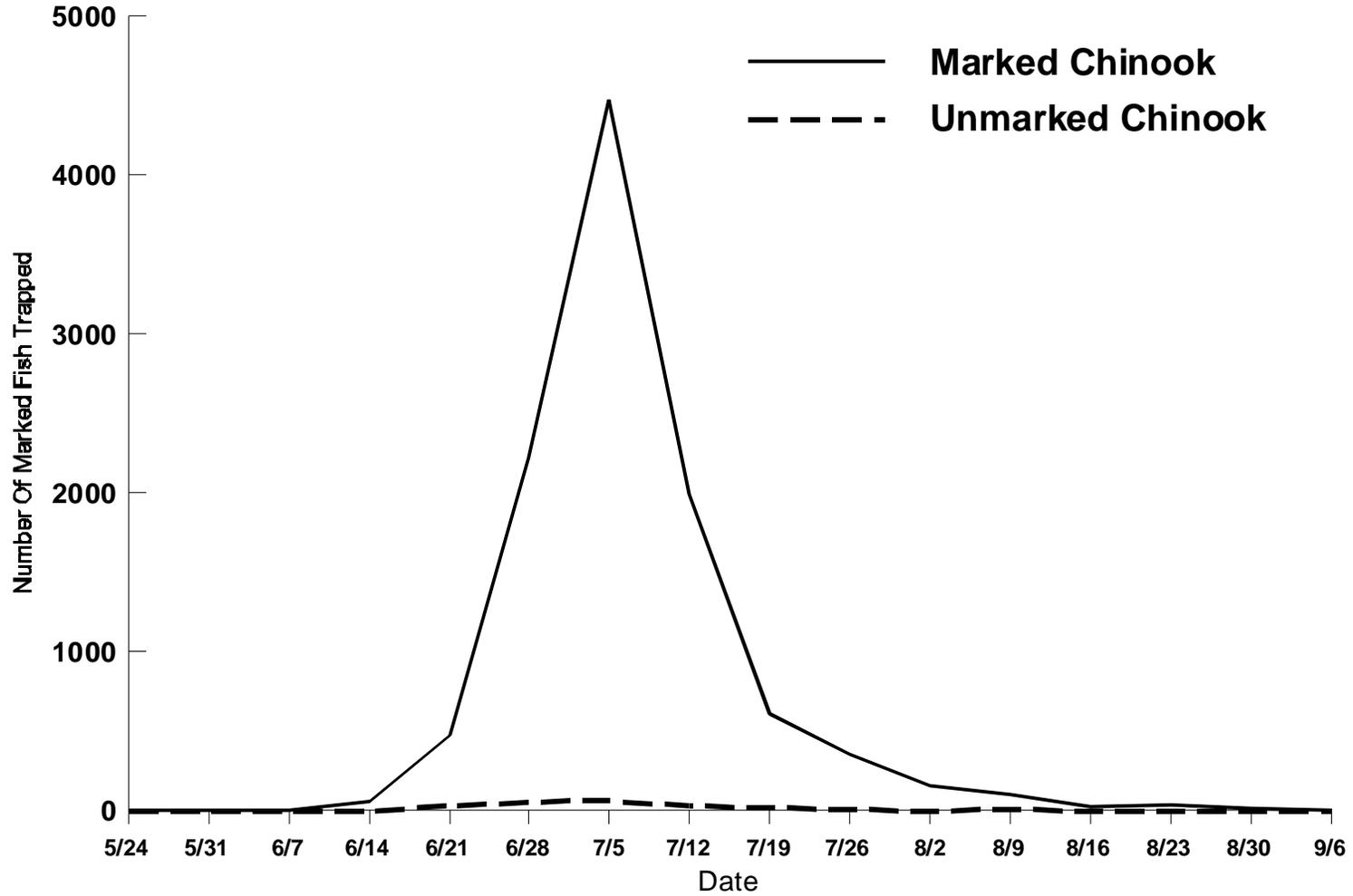
This table includes 101 fish transferred to SFH that were not released.

Appendix 8. Rapid River marked chinook run timing for 1997.

Week ending	Number of fish	Percentage of marked chinook
May 24	0	0.00
May 31	2	0.02
June 7	1	0.01
June 14	57	0.54
June 21	472	4.49
June 28	2,220	21.10
July 5	4,476	42.55
July 12	1,994	18.95
July 19	610	5.80
July 26	351	3.34
August 2	157	1.49
August 9	107	1.02
August 16	28	0.26
August 23	36	0.34
August 30	9	0.09
September 6	0	0.00
Total	10,520	100.00

Appendix 9. Adult salmon returns to Rapid River trap during 1997.

WEEKLY TRAP COUNT



Appendix 10. Fork length vs hypural length.

Sample date	Fork length (mm)	Hypural length (mm)	Weight (kg)	Sample date	Fork length (mm)	Hypural length (mm)	Weight (kg)
6/23	740	610	4.63	6/25	690	608	
6/23	780	584	5.22	6/25	670	597	
6/23	760	578	5.99	6/25	760	668	
6/23	890	712	7.67	6/25	680	615	
6/23	740	609	5.22	7/6	710	588	4.08
6/23	700	572	3.95	7/6	760	615	4.35
6/23	800	641	5.90	7/6	710	561	2.77
6/23	800	662	6.34	7/6	810	690	5.67
6/23	770	639	5.44	7/6	890	743	7.53
6/23	810	658	5.99	7/6	790	672	5.76
6/23	820	674	6.35	7/6	720	617	4.04
6/23	630	520	3.04	7/6	780	652	5.85
6/23	750	586	5.03	7/6	810	675	5.26
6/23	730	607	5.08	7/6	690	592	3.81
6/23	800	655	5.49	7/6	720	617	
6/23	790	635	5.08	7/6	720	605	
6/23	750	607	4.99	7/6	760	640	
6/23	740	620	5.03	7/6	740	630	
6/23	840	631	5.90	7/6	740	635	
6/23	680	551	3.67	7/6	740	630	
6/24	780	640		7/6	710	597	
6/24	760	635		7/6	730	619	
6/24	780	610		7/6	770	663	
6/24	750	608		7/6	700	590	
6/24	740	627		8/4	740	625	
6/24	790	674		8/4	820	663	
6/24	750	603		8/4	690	585	
6/24	700	682		8/4	780	643	
6/24	760	620		8/4	760	625	
6/24	650	535		8/4	770	645	
6/24	720	593		8/4	750	620	
6/24	860	675		8/4	700	590	
6/24	710	605		8/4	730	605	
6/24	750	593		8/4	750	623	
6/24	790	641		8/4	790	667	
6/24	750	605		8/4	580	485	
6/24	790	664		8/4	760	615	
6/24	760	615		8/4	750	630	
6/24	800	625		8/4	750	635	
6/24	730	590		8/4	630	515	
6/25	730	570		8/4	720	610	
6/25	670	581		8/4	760	627	
6/25	71	607		8/4	700	587	
6/25	720	618		8/4	760	642	
6/25	790	686					

For this study, lengths were measured to the nearest mm and weights to the nearest g.

Appendix 11. Rapid River chinook broodstock lengths for 1997.

Fork length (cm)	Number of fish	Fork length (cm)	Number of fish
< 50	0	88	2
50	0	89	8
51	0	90	2
52	0	91	4
53	0	92	0
54	0	93	0
55	0	94	0
56	1	95	1
57	1	96	0
58	1	97	0
59	0	98	0
60	1	99	0
61	1	100	0
62	2	> 100	0
63	2	Total	3087
64	3		
65	5		
66	11		
67	13		
68	23		
69	53		
70	72		
71	118		
72	158		
73	192		
74	286		
75	265		
76	334		
77	323		
78	327		
79	226		
80	225		
81	135		
82	105		
83	64		
84	52		
85	36		
86	22		
87	13		

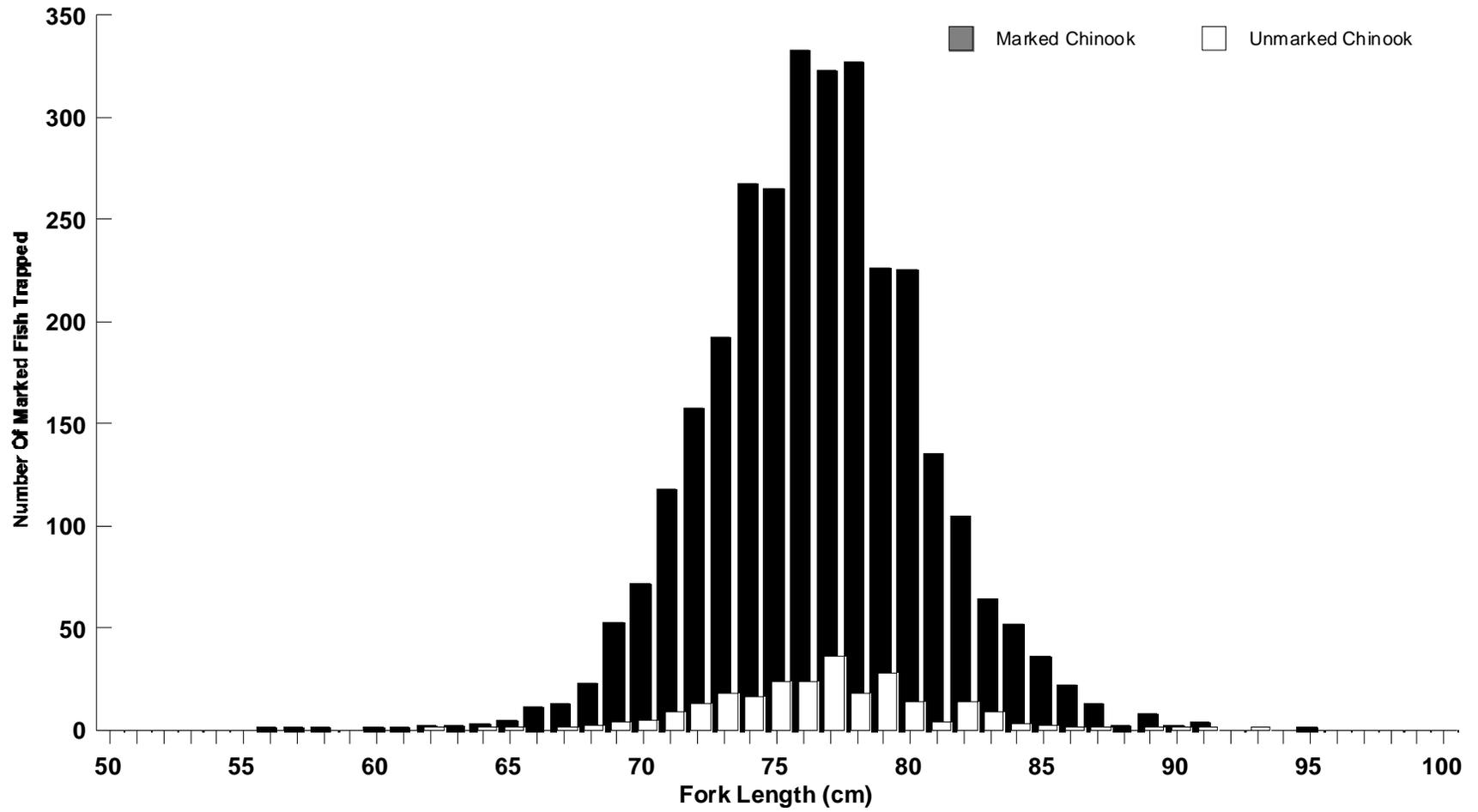
Sex composition data	
3 (0.10%)	jacks
1,374 (44.51%)	males
1,710 (55.39%)	females
3,087 (100.00%)	total

Age-class data	
3 (0.10%)	three-year-old
3,032 (98.22%)	four-year-old
52 (1.68%)	five-year old
3,087 (100.00%)	total

Age-class criteria	
< 59 cm =	three-year old
59 – 85 cm =	four-year-old
> 85 cm =	five-year-old

This table includes only fish held for spawning.

Appendix 12. Length-frequency of Rapid River Fish Hatchery broodstock for 1997.



Appendix 13. Rapid River adult PIT-tag detection for 1997.

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Scale tag #	Comments
6/24	22493B1B77	H	79	U-C, AD	***	F	Ponded, HP-2, Spawned 9/1/97	***	Bucket# 618
6/24	2247060740	H	76	U-C, AD	JT# C2059	U	Ponded, HP-2	***	
6/24	1F7C301C19	H	74	U-C, AD	***	U	Ponded, HP-2	***	
6/25	225E710A12	H	75	U-C, AD	JT# C3023	F	Ponded, HP-2, Spawned 9/1/97	***	Bucket# 687, CWT
6/25	225C4C693C	H	76	U-C, LV	***	U	Ponded, HP-2	***	Adipose not clipped, LV clip with CWT
6/26	7F7A247824	H	81	AD	***	U	Ponded, HP-2	***	
6/26	2247606F61	H	72	AD	JT# C1006	U	Ponded, HP-2	***	
6/26	225B5D406D	H	75	AD	JT# C2104	F	Ponded, HP-2; Spawned 9/4/97	***	Bucket# 998
6/26	7F7A11701B	H	75	AD	***	U	Ponded, HP-2	***	
6/26	225B737B6A	H	78	AD	JT# C2081	U	Ponded, HP-2	***	
6/27	22476A1527	H	78	U-C, AD	JT# C2035	U	Ponded, HP-2	***	
6/27	2251160C70	H	80	U-C, AD	***	F	Ponded, HP-2; Spawned 9/1/97	***	Bucket# 505
6/27	7F7A1B6863	H	69	U-C, AD	***	U	Ponded, HP-2	***	Nitrogen Burned
6/28	2228623B74	W	79	None	***	M	Released, Rapid River	84	Wild Fish, Genetic Sample# 31
6/29	225B256865	H	80	AD	***	U	Ponded, HP-2	***	
6/29	2246655C77	W	76	None	JT# C2093	F	Released, Rapid River	89	Wild Fish, Genetic Sample# 36
6/30	22457C106E	H	76	AD	***	M	Ponded, HP-1; Pond Mort 9/4/97	***	
6/30	224572367F	H	76	LV	JT# 02078	M	Ponded, HP-1; Spawned 9/5/97	***	Adipose not clipped, LV clip, CWT
7/1	224F721B7E	H	76	AD	JT# C3055	U	Ponded, HP-2	***	
7/2	22492C0168	H	67	AD	JT# C2128	U	Ponded, HP-1	***	
7/4	22453A4C3F	H	78	AD	JT# C2016	F	Ponded, HP-2, Pond Mort: 7/4/97	***	
7/4	2250652438	H	72	AD	JT# C2120	F	Ponded, HP-2; Spawned 9/4/97	***	Bucket# 996
7/4	225D327900	H	79	AD	JT# C3074	M	Ponded, HP-2; Pond Mort 7/4/97	***	
7/4	22620A505A	H	73	AD	JT# C2028	F	Ponded, HP-2; Spawned 9/4/97	***	Bucket# 929
7/5	22513A1404	H	Unk	AD	JT# C2113	U	Sport Fishery	***	Tag brought in by Angler
7/6	2251046E35	H	72	AD	JT# C2102	U	Trap Mort	***	Trap Mortality
7/7	225C7C6C7E	H	75	AD	JT# C2096	F	Killed, Food Bank	***	
7/7	22626A5D53	H	76	AD	***	M	Killed, Food Bank	***	
7/7	22480A275D	H	74	AD	JT# C2019	M	Killed, Food Bank	***	
7/8	2249711077	H	75	AD	***	F	Killed, Food Bank	***	
7/10	2249697115	H	79	AD	JT# C3044	F	Killed, Nez Perce Tribe	***	
7/10	222A16345E	H	73	AD	JT# C3190	M	Killed, W.I.C.A.	***	
7/10	224F415567	H	76	LV	JT# C3092	F	Killed, W.I.C.A.	***	Adipose not clipped, LV clip with CWT

Appendix 13. (Continued).

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Scale bag #	Comments
7/11	22604B172C	H	73	AD	JT# C2071	M	Killed, Idaho Hunger Action Council	***	
7/11	225B403573	H	71	AD	JT# C2157	F	Killed, Idaho Hunger Action Council	***	
7/11	225069641A	H	74	AD	JT# C2166	M	Killed, Idaho Hunger Action Council	***	
7/11	225B69264E	H	71	AD	JT# C2137	M	Killed, Idaho Hunger Action Council	***	
7/11	22504E7301	H	68	AD	JT# C2182	F	Killed, Idaho Hunger Action Council	***	
7/11	224834382F	H	69	AD	JT# C2006	M	Killed, Idaho Hunger Action Council	***	
7/12	22493D6570	H	77	AD	JT# C2285	F	Killed, Idaho Hunger Action Council	***	
7/12	22494B2275	H	77	AD	***	F	Killed, Idaho Hunger Action Council	***	
7/12	22495A0614	H	75	AD	***	M	Killed, Idaho Hunger Action Council	***	
7/12	2228645872	H	74	AD	JT# C2080	F	Outplanted, S. Fork Clearwater	***	
7/12	222866321D	H	76	AD	JT# C3106	F	Outplanted, S. Fork Clearwater	***	
7/12	224662686F	H	80	AD	JT# C3122	M	Outplanted, S. Fork Clearwater	***	
7/12	225F6A4C69	H	73	AD	JT# C2066	F	Outplanted, S. Fork Clearwater	***	
7/12	7F7B0E0A00	H	72	AD	***	F	Outplanted, S. Fork Clearwater	***	
7/13	22495A211A	H	75	AD	***	M	Outplanted, S. Fork Clearwater	***	
7/14	22510A7B4E	H	79	AD	***	M	Killed, Nez Perce Tribe	***	
7/15	22621B181D	H	72	AD	***	F	Ponded, HP-1	***	
7/15	225F091C6B	W	82	None	JT# C3063	M	Released, Rapid River	200	Wild Fish
7/15	224F615A3B	H	73	AD	JT# C3198	F	Ponded, HP-1; Spawned 9/1/97	***	Bucket #439
7/15	2261471D61	H	76	AD	JT# C3133	F	Ponded, HP-1	***	Nitrogen Burned, Genetics# 48
7/15	2247721211	H	69	AD	JT# C2103	M	Ponded, HP-1	***	
7/15	225C3A302F	H	80	AD	JT# C3032	M	Ponded, HP-1; Pond Mort 9/1/97	***	Nitrogen Burned
7/15	224F407744	H	73	AD	JT# C2072	F	Ponded, HP-1; Spawned 9/5/97	***	Nitrogen Burned, Bucket# 186
7/15	2250203025	H	70	AD	JT# C2247	F	Ponded, HP-1	***	
7/15	2260462B42	H	72	AD	JT# C2194	M	Ponded, HP-1	***	
7/16	225C0C3611	H	77	AD	JT# C2014	M	Outplanted, Miller Creek	***	
7/16	7F7D2D096D	H	74	AD	***	M	Outplanted, S. Fork Clearwater	***	
7/16	225E794A3C	H	75	AD	JT# C2053	F	Outplanted, S. Fork Clearwater	***	
7/16	225E145009	H	68	AD	JT# C2199	M	Outplanted, S. Fork Clearwater	***	
7/16	22510B3A00	H	75	AD	***	M	Outplanted, S. Fork Clearwater	***	
7/16	224F453511	H	79	AD	JT# C4025	M	Outplanted, S. Fork Clearwater	***	
7/16	222A37666E	H	76	AD	***	F	Outplanted, S. Fork Clearwater	***	
7/16	2247741660	H	76	AD	JT# C3064	M	Outplanted, S. Fork Clearwater	***	
7/16	2250612517	H	71	AD	JT# C2179	F	Outplanted, S. Fork Clearwater	***	

Appendix 13. (Continued).

Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Scale tag #	Comments
7/17	2261527D6F	H	63	AD	JT# C1013	F	Killed, Idaho Hunger Action Council	***	
7/17	225E745651	H	76	AD	JT# C2040	F	Killed, Idaho Hunger Action Council	***	
7/17	2263025F22	H	71	AD	***	F	Killed, Idaho Hunger Action Council	***	
7/17	224743761E	H	77	AD	JT# C2058	F	Killed, Idaho Hunger Action Council	***	
7/17	22495B1347	H	69	AD	JT# C2286	F	Killed, Idaho Hunger Action Council	***	
7/17	22460A5156	H	66	AD	JT# C2142	F	Killed, Idaho Hunger Action Council	***	
7/17	225C0F5202	H	74	AD	JT# C2152	M	Killed, Idaho Hunger Action Council	***	
7/17	225B4B0E7B	H	77	AD	***	F	Killed, Idaho Hunger Action Council	***	
7/17	225F524019	H	73	LV	JT# C2235	F	Killed, Idaho Hunger Action Council	***	Adipose not clipped, LV clip with CWT
7/18	22462B7D0A	H	72	AD	JT# C2088	F	Killed, N.O.I.S.E.	***	
7/18	2261595952	H	78	AD	JT# C3218	F	Killed, N.O.I.S.E.	***	
7/21	224F645817	H	79	AD	JT# C3174	M	Killed, Idaho Hunger Action Council	***	
7/21	225F3D7119	H	78	AD	JT# C3062	M	Killed, Idaho Hunger Action Council	***	
7/21	7F7A10157F	H	61	AD	***	M	Killed, Idaho Hunger Action Council	***	
7/21	225D70322E	H	73	AD	JT# C3206	M	Killed, Idaho Hunger Action Council	***	
7/21	7F7B0E2B3A	H	78	AD	***	F	Killed, Idaho Hunger Action Council	***	
7/22	225D261368	H	79	AD	***	F	Killed, Idaho Hunger Action Council	***	
7/22	225D6E7E5B	H	79	AD	JT# C4024	M	Killed, Idaho Hunger Action Council	***	
7/22	222A2A0D66	H	78	AD	JT# C3117	M	Killed, Idaho Hunger Action Council	***	
7/23	225B7A4960	H	74	AD	JT# C3200	M	Ponded, HP-1, Pond Mort 08/11/97	***	
7/23	2247086411	H	68	AD	JT# C3182	F	Ponded, HP-1	***	
7/23	225A7D185F	H	79	AD	***	M	Ponded, HP-1	***	
7/23	22622A1739	H	77	AD	JT# C3021	M	Ponded, HP-1; Pond Mort: 8/6/97	***	
7/23	2213250707	H	76	AD	***	F	Ponded, HP-2; Spawned 9/4/97	***	Bucket# 931
7/23	225B5D314A	H	80	AD	***	M	Ponded, HP-2; Pond Mort 9/4/97	***	
7/25	2248160064	H	69	AD	JT# C2291	F	Released, Boise/Payette River	***	
7/25	2251222A2A	H	72	AD	***	M	Released, Boise/Payette River	***	
7/25	2250224272	H	80	AD	JT# C3120	M	Killed, Idaho Hunger Action Council	***	
7/25	225A60620A	H	75	AD	JT# C2293	F	Killed, Idaho Hunger Action Council	***	
7/25	2250077D4B	H	72	AD	JT# C2177	M	Killed, Idaho Hunger Action Council	***	
7/25	225E4D695F	H	72	AD	JT# C3109	M	Killed, Idaho Hunger Action Council	***	
7/25	225F330315	W	80	None	JT# C4093	M	Released, Rapid River	231	
7/28	22614A2A5E	H	67	AD	JT# C2259	M	Outplanted, Boise River	***	
7/28	225B504F69	H	73	AD	JT# C2233	F	Outplanted, Boise River	***	

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Appendix 13. (Continued).

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Capture date	PIT-tag code	W/H	Fork length (cm)	Clips	Other tags	Sex M/F	Disposition	Scale tag #	Comments
7/31	2245553B68	H	80	AD	JT# C4040	M	Ponded, HP-2, Pond Mort 8/8/97	***	
7/31	2246324861	H	75	AD	JT# C2033	M	Outplanted, Sawtooth Hatchery	***	
7/31	22450C796B	H	82	AD	JT# C4045	M	Outplanted, Sawtooth Hatchery	***	
7/31	2245152943	H	74	AD	JT# C3005	M	Outplanted, Sawtooth Hatchery	***	
8/1	2245194F4C	H	78	AD	JT# C4036	M	Ponded, HP-2; Pond Mort: 8/8/97	***	
8/4	2251082465	H	69	AD	JT# C2141	F	Killed, Shoshone-Bannock	***	
8/8	2262787C78	H	76	AD	JT# C3195	M	Killed, Idaho Hunger Action Council	***	
Unk	22502F2A01	H	72	AD	***	F	Ponded, HP-2, Pond Mort 8/7/97	***	Missed scan during capture
Unk	225F6D4B1B	H	74	AD	***	M	Ponded, HP-2, Pond Mort 8/7/97	***	Missed scan during capture
Unk	225E165640	H	76	AD	JT# C3016	F	Ponded, HP-1, Pond Mort 7/16/97	***	Fish Captured at Oxbow Adult Trap
8/12	225E0E7D29	H	72	AD	JT# C3115	F	Ponded, HP-2, Pond Mort 8/14/97	***	
8/15	225D320F2A	H	70	AD	JT# C2232	F	Ponded, HP-2, Pond Mort 8/15/97	***	
Unk	225F5D1321	H	85	AD	***	F	Ponded, HP-2, Spawned 8/18/97	***	Missed scan during capture
Unk	7F7A101724	H	Unk	AD	***	U	Unk	***	Lone Tag # found on a undated trap sheet
8/20	2249325F57	H	79	AD	JT# C3152	M	Ponded, HP-2	***	
8/20	22477E4F32	H	64	LV	JT# C2172	M	Ponded, HP-2	***	Adipose not clipped, LV clip
8/22	225B4F1904	H	79	AD	JT# C3029	M	Ponded, HP-2; Pond Mort 9/8/97	***	
8/29	225C484341	H	69	AD	***	F	Ponded, HP-2	***	
Unk	22454F4827	H	Unk	AD	JT# C2009	Unk	Ponded, HP-1, Spawned 9/2/97	***	Fish Captured at Oxbow Adult Trap, Bucket# 790
Unk	7F7A102745	H	Unk	AD	***	Unk	Ponded, HP-1, Spawned 8/29/97	***	Fish Captured at Oxbow Adult Trap, Bucket# 397
Unk	22456E5B4D	H	Unk	AD	JT# C3038	Unk	Ponded, HP-1	***	Fish Captured at Oxbow Adult Trap,
Unk	2261652B42	H	81	AD	JT# C3006	M	Ponded, HP-1; Spawned 9/5/97	***	Fish Captured at Oxbow Adult Trap,
Unk	222A192A60	H	85	AD	JT# C3034	M	Ponded, HP-1; Spawned 9/5/97	***	Fish Captured at Oxbow Adult Trap,
Unk	225D6B175C	H	Unk	LV	JT# C2143	F	Ponded, HP-1; Spawned 9/9/97	***	Fish Captured at Oxbow Adult Trap, Not AD clipped
Unk	225F0A474E	H	Unk	AD	***	M	Ponded, HP-1; Pond Mort 9/8/97	***	
Unk	7F7A12727A	H	74	AD	***	M	Ponded, HP-1; Pond Mort 9/8/97	***	Fish Captured at Oxbow Adult Trap,
Unk	1F5F16707C	H	78	AD	***	M	Ponded, HP-1; Pond Mort 9/9/97	***	Fish Captured at Oxbow Adult Trap,
Unk	22492C0168	H	75	AD	***	M	Ponded, HP-1; Spawned 9/9/97	***	Fish Captured at Oxbow Adult Trap,
Unk	225C0B5C66	H	70	AD	JT#C2068	M	Ponded, HP-1; Pond Mort 9/11/97	***	Fish Captured at Oxbow Adult Trap, CWT
Unk	225E321B5D	H	81	AD	***	M	Ponded, HP-1; Pond Mort 9/11/97	***	Fish Captured at Oxbow Adult Trap,
Unk	2262142537	H	76	AD	JT# C3017	M	Ponded, HP-1; Pond Mort 9/15/97	***	Fish Captured at Oxbow Adult Trap,

Appendix 14. Rapid River Fish Hatchery chinook recaptures with jaw tags for 1997.

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Recapture date	Recapture location	Sex	Fork length (cm)	Jaw tag number	Pit tag number	Comments
6/24/97	Rapid River Trap	U	76	C2059	2247060740	Adipose Clipped (AD Clip)
6/25/97	Rapid River Trap	U	75	C3023	225E710A12	AD Clip
6/26/97	Rapid River Trap	U	78	C2081	225B737B6A	AD Clip
6/26/97	Rapid River Trap	U	75	C2104	225B5D406D	AD Clip
6/26/97	Rapid River Trap	U	72	C1006	2247606F61	AD Clip
6/27/97	Rapid River Trap	U	78	C2035	22476A1527	AD Clip
6/28/97	Rapid River Trap	U	77	C2083	None	AD Clip
6/28/97	Little Salmon River	M	84	C3010	Not Checked	L. Salmon R. @ Squaw Creek (sport fishery)
6/29/97	Little Salmon River	M	Unknown	C2097	Not Checked	L. Salmon R. below Rapid River (sport fishery)
6/29/97	Little Salmon River	M	Unknown	C2007	Not Checked	L. Salmon R. 1/4 mi. below Rapid River (sport fishery)
6/29/97	Little Salmon River	U	Unknown	C2048	Not Checked	L. Salmon R. @ unknown location (sport fishery)
6/29/97	Rapid River Trap	F	76	C2093	2246655C77	Wild Fish (unmarked)
6/30/97	Little Salmon River	F	Unknown	C1002	Not Checked	L. Salmon R. @ milepost 194
6/30/97	Rapid River Trap	U	76	C2078	224572367F	Left Ventral Clipped (LV Clip)
7/1/97	Rapid River Trap	U	76	C3055	224F721B7E	AD Clip
7/2/97	Rapid River Trap	U	67	C2128	22492C0168	AD Clip
7/3/97	Little Salmon River	U	Unknown	C3191	Not Checked	L. Salmon R. @ milepost 192.5 (sport fishery)
7/3/97	Little Salmon River	U	Unknown	C2269	Not Checked	L. Salmon R. 1/4 mi. above Salmon R. Bridge (sport fishery)
7/3/97	Little Salmon River	U	Unknown	C2065	Not Checked	L. Salmon R. @ unknown location (sport fishery)
7/4/97	Rapid River Trap	U	72	C2120	2250652438	AD Clip
7/4/97	Rapid River Trap	U	73	C2028	22620A505A	AD Clip
7/4/97	Rapid River Trap	F	78	C2016	22453A4C3F	AD Clip
7/4/97	Rapid River Trap	M	79	C3074	225D327900	AD Clip
7/5/97	Little Salmon River	U	Unknown	C2113	22513A1404	L. Salmon R. below Rapid River (sport fishery)
7/5/97	Little Salmon River	F	Unknown	C3142	Not Checked	L. Salmon R. below Rapid River (sport fishery)
7/6/97	Rapid River Trap	U	72	C2102	2251046E35	AD Clip
7/7/97	Rapid River Trap	F	75	C2096	225C7C6C7E	AD Clip
7/7/97	Rapid River Trap	M	74	C2019	22480A275D	AD Clip

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Appendix 14. (Continued).

Recapture date	Recapture location	Sex	Fork length (cm)	Jaw tag number	Pit tag number	Comments
7/8/97	Little Salmon River	U	Unknown	C2094	Not Checked	L. Salmon R. @ unknown location (sport fishery)
7/8/97	Little Salmon River	F	Unknown	C3087	Not Checked	L. Salmon R. @ unknown location (sport fishery)
7/10/97	Rapid River Trap	F	79	C3044	2249647115	AD Clip
7/10/97	Rapid River Trap	M	73	C3190	222A16345E	AD Clip
7/10/97	Rapid River Trap	F	76	C3092	224F415567	LV Clip
7/10/97	Rapid River Trap	U	73	C2262	No PIT Tag	AD Clip-Fish scanned for PIT tag but none found
7/10/97	Rapid River Trap	M	74	C2012	225B4A5E68	AD Clip
7/11/97	Rapid River Trap	M	73	C2071	22604B172C	AD Clip
7/11/97	Rapid River Trap	F	71	C2157	225B403573	AD Clip
7/11/97	Rapid River Trap	M	74	C2166	225069641A	AD Clip
7/11/97	Rapid River Trap	M	71	C2137	225B69264E	AD Clip
7/11/97	Rapid River Trap	F	68	C2182	22504E7301	AD Clip
7/11/97	Rapid River Trap	M	69	C2006	224834382F	AD Clip
7/12/97	Rapid River Trap	F	77	C2285	22493D6570	AD Clip
7/12/97	Rapid River Trap	F	74	C2080	2228645872	AD Clip
7/12/97	Rapid River Trap	F	76	C3106	222866321D	AD Clip
7/12/97	Rapid River Trap	M	80	C3122	224662686F	AD Clip
7/12/97	Rapid River Trap	F	73	C2066	225F6A4C69	AD Clip
7/13/97	Little Salmon River	U	Unknown	C2296	Not Checked	L. Salmon R. @ unknown location (sport fishery)
7/13/97	Little Salmon River	U	Unknown	C2001	Not Checked	L. Salmon R. @ unknown location (sport fishery)
7/15/97	Rapid River Trap	M	82	C3063	225F091C6B	Wild fish (unmarked)
7/15/97	Rapid River Trap	F	73	C3198	224F615A3B	AD Clip
7/15/97	Rapid River Trap	F	76	C3133	2261471D61	AD Clip
7/15/97	Rapid River Trap	F	69	C2103	2247721211	AD Clip
7/15/97	Rapid River Trap	M	80	C3032	225C3A302F	AD Clip
7/15/97	Rapid River Trap	F	73	C2072	224F407744	AD Clip
7/15/97	Rapid River Trap	F	70	C2247	2250203025	AD Clip
7/15/97	Rapid River Trap	M	72	C2194	2260462B42	AD Clip
7/16/97	Rapid River Trap	M	77	C2014	225C0C3611	AD Clip
7/16/97	Rapid River Trap	F	75	C2053	225E794A3C	AD Clip
7/16/97	Rapid River Trap	F	76	C2132	No PIT Tag	AD Clip-Fish scanned for PIT tag but none found

Appendix 14. (Continued).

Recapture date	Recapture location	Sex	Fork length (cm)	Jaw tag number	Pit tag number	Comments
7/16/97	Rapid River Trap	M	68	C2199	225E145009	AD Clip
7/16/97	Rapid River Trap	M	79	C4025	224F453511	AD Clip
7/16/97	Rapid River Trap	M	76	C3064	2247741660	AD Clip
7/16/97	Rapid River Trap	F	71	C2179	2250612517	AD Clip
7/17/97	Rapid River Trap	F	63	C1013	2261527D6F	AD Clip
7/17/97	Rapid River Trap	F	76	C2040	225E745651	AD Clip
7/17/97	Rapid River Trap	F	77	C2058	224743761	AD Clip
7/17/97	Rapid River Trap	F	69	C2286	22495B1347	AD Clip
7/17/97	Rapid River Trap	F	66	C2142	22460A5156	AD Clip
7/17/97	Rapid River Trap	F	78	C3197	No PIT Tag	AD Clip-Fish scanned for PIT tag but none found
7/17/97	Rapid River Trap	M	74	C2152	225C0F5202	AD Clip
7/17/97	Rapid River Trap	F	73	C2235	225F524019	LV Clip
7/18/97	Rapid River Trap	F	72	C2088	22462B7D0A	AD Clip
7/18/97	Rapid River Trap	F	78	C3218	2261595952	AD Clip
7/21/97	Rapid River Trap	M	79	C3174	224F645817	AD Clip
7/21/97	Rapid River Trap	M	78	C3062	225F3D7119	AD Clip
7/21/97	Rapid River Trap	M	73	C3206	225D70322E	AD Clip
7/22/97	Rapid River Trap	M	79	C4024	225D6E7E5B	AD Clip
7/22/97	Rapid River Trap	M	78	C3117	222A2A0D66	AD Clip
7/23/97	Rapid River Trap	M	77	C3021	22622A1739	AD Clip
7/23/97	Rapid River Trap	F	68	C3182	2247086411	AD Clip
7/23/97	Rapid River Trap	M	74	C3200	225B7A4960	AD Clip
7/25/97	Rapid River Trap	F	69	C2291	2248160064	AD Clip
7/25/97	Rapid River Trap	M	80	C3120	2250224272	AD Clip
7/25/97	Rapid River Trap	F	75	C2293	225A60620A	AD Clip
7/25/97	Rapid River Trap	M	72	C2177	2250077D4B	AD Clip
7/25/97	Rapid River Trap	M	72	C3109	225E4D695F	AD Clip
7/25/97	Rapid River Trap	M	77	C4093	225F330315	Wild fish (unmarked)
7/28/97	Rapid River Trap	M	67	C2259	22614A2A5E	AD Clip
7/28/97	Rapid River Trap	F	73	C2233	225B504F69	AD Clip
7/31/97	Rapid River Trap	M	82	C4040	2245553B68	AD Clip
7/31/97	Rapid River Trap	M	75	C2033	2246324861	AD Clip
7/31/97	Rapid River Trap	M	82	C4045	22450C796B	AD Clip

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Appendix 14. (Continued).

Recapture date	Recapture location	Sex	Fork length (cm)	Jaw tag number	Pit tag number	Comments
7/31/97	Rapid River Trap	M	74	C3005	2245152943	AD Clip
8/1/97	Rapid River Trap	U	78	C4036	2245194F4C	AD Clip
8/4/97	Rapid River Trap	F	69	C2141	2251082465	AD Clip
8/8/97	Rapid River Trap	M	76	C3195	2262787C78	AD Clip
8/12/97	Rapid River Trap	F	73	C3115	225E0E7D29	AD Clip
8/15/97	Rapid River Trap	F	70	C2232	225D320F2A	AD Clip
8/20/97	Rapid River Trap	M	79	C3152	2249325F57	AD Clip
8/20/97	Rapid River Trap	M	64	C2172	22477E4F32	LV Clip
8/22/97	Rapid River Trap	M	79	C3029	225B4F1904	AD Clip
5/19/97	Oxbow Trap	U	77	C4001	Not Checked	AD Clip
5/23/97	Oxbow Trap	F	77	C2009	22454F4827	AD Clip
5/27/97	Oxbow Trap	F	79	C2143	225D6B175C	AD Clip
5/27/97	Oxbow Trap	F	72	C2003	Not Checked	AD Clip
5/28/97	Oxbow Trap	U	76	C3033	Not Checked	Wild fish (unmarked)
5/29/97	Oxbow Trap	M	70	C2068	225C0B5C66	AD Clip
5/29/97	Oxbow Trap	M	81	C3006	2261652B42	AD Clip
6/3/97	Oxbow Trap	F	76	C3016	225E165640	AD Clip
6/3/97	Oxbow Trap	M	76	C3017	2262142537	AD Clip
6/3/97	Oxbow Trap	M	85	C3034	222A192A60	AD Clip
6/4/97	Oxbow Trap	F	74	C2111	No PIT Tag	AD Clip-Fish scanned for PIT tag but none found
6/4/97	Oxbow Trap	F	75	C2100	Not Checked	AD Clip
6/5/97	Oxbow Trap	M	81	C3038	22456E5B4D	AD Clip
UNKNOWN	??**	U	Unknown	C3107	Unknown	L. Salmon R./Rapid R. Return-No Additional Data
UNKNOWN	??**	U	Unknown	C2032	Unknown	L. Salmon R./Rapid R. Return-No Additional Data
UNKNOWN	??**	U	Unknown	C2078	Unknown	L. Salmon R./Rapid R. Return-No Additional Data
UNKNOWN	??**	U	Unknown	C3090	Unknown	L. Salmon R./Rapid R. Return-No Additional Data
UNKNOWN	??**	U	Unknown	C3009	Unknown	L. Salmon R./Rapid R. Return-No Additional Data
UNKNOWN	??**	U	Unknown	C2121	Unknown	L. Salmon R./Rapid R. Return-No Additional Data
UNKNOWN	??**	U	Unknown	C3201	Unknown	L. Salmon R./Rapid R. Return-No Additional Data

All jaw tags recovered in the sport fishery were fish of hatchery origin. Hatchery fish are recorded as unknown sex at the trap. Sex is determined at first sort.

"Oxbow Trap" fish were trapped at Hells Canyon Dam on the Snake River and transported to Rapid River Fish Hatchery

The 7 "unknowns" listed above are tags returned to Rapid River Fish Hatchery with no available data.

Appendix 15. Rapid River Hatchery adult recaptures with VI and radio tags.

Trap date	VI tag number	Radio CH/code	Fin clip	Length (cm)	Sex	*Disposition
6-24	E96	17/93	AD	72	F	H
6-25	T96	21/80	AD	71	M	H
6/25	N16	18/113	AD	77	F	H
6/26	F93	22/80	AD	73	M	H
6/26	N22	17/135	AD	72	M	H
6/28	EK2	22/95	AD	74	U	H
6/28	KN6	17/109	AD	81	U	H
6/28	BD1	18/135	AD	73	U	H
6/30	BJ9	19/112	AD	75	U	H
6/30		18/34	AD	63	U	H
6/30	E47	22/44	AD	69	U	H
7/2	N08	18/129	AD	71	U	H
7/2		13/43	AD	71	U	H
7/2	BC8	17/102	AD	70	U	H
7/2	N57	19/69	AD	73	U	H
7/3	F11	21/71	AD	89	U	H
7/4	EK7	21/20	AD	73	M	H
7/7	EL1	22/127	AD	77	F	H
7/8	EH1	22/84	AD	75	F	D
7/8	F40	19/139	AD	79	M	D
7/8	F35	19/142	AD	77	F	D
7/8	F75	19/99	AD	75	F	D
7/8	F42	22/90	AD	77	M	D
7/10	F80	16/102	AD	81	F	H
7/10	T93	21/85	AD	79	M	H
7/10	ED3	22/23	AD	78	M	H
7/10	T97	21/79	AD	72	M	H
7/10	F23	18/69	AD	76	F	H
7/10		16/45	AD	77	M	D
7/11	N48	18/112	AD	72	F	H
7/11	N30	19/129	AD	78	M	H
7/13	EV6	19/89	AD	72	M	R
7/13	E89	16/97	AD	69	M	R
7/14	N93	16/90	AD	76	F	D
7/15	EJ0	18/72	AD	71	F	H
7/16		19/122	AD	75	F	R
7/16		21/25	AD	87	F	R
7/17	N59	19/87	AD	70	F	D
7/17		16/96	LV	78	F	D
7/18	E27	22/45	AD	74	F	D
7/21	ER7	20/138	AD	68	F	D
7/21	BL1	15/124	AD	74	F	D
7/31	F56	21/59	AD	68	F	D
8/4		19/119	NO MARK	79	M	R
8/8	EH9	21/136	AD	74	F	D
8/8	BC4	15/111	AD	78	F	D

*H = held, R = released, D = donated for consumption

Appendix 16. Injuries to adult chinook returning to Rapid River Hatchery for 1997.

Nitrogen blister	Body injury	Gill net scar	Gaff wound	Eye damage	Lamprey mark	Fin damage	Body scar	Bite wound
283	154	39	13	14	16	10	6	4

These numbers are from a sample size of 4,276 Rapid River returns.

Appendix 17. Rapid River unmarked chinook run timing for 1997.

Week ending	Number of fish	Percentage of unmarked chinook
May 24	0	0.00
May 31	0	0.00
June 7	0	0.00
June 14	4	1.58
June 21	32	12.65
June 28	56	22.13
July 5	70	27.67
July 12	31	12.25
July 19	28	11.07
July 26	17	6.72
August 2	5	1.98
August 9	9	3.55
August 16	0	0.00
August 23	1	0.40
August 30	0	0.00
September 6	0	0.00
Total	253	100.00

Appendix 18. Rapid River unmarked chinook lengths for 1997.

Fork length (cm)	Number of fish	Fork length (cm)	Number of fish
< 50	0	88	0
50	0	89	1
51	0	90	1
52	0	91	1
53	0	92	0
54	0	93	1
55	0	94	0
56	0	95	0
57	0	96	0
58	0	97	0
59	0	98	0
60	0	99	0
61	0	100	0
62	1	> 100	0
63	0	Total	253
64	1		
65	1		
66	0		
67	1		
68	2		
69	4		
70	5		
71	9		
72	13		
73	18		
74	16		
75	24		
76	24		
77	36		
78	18		
79	28		
80	14		
81	4		
82	14		
83	9		
84	3		
85	2		
86	1		
87	1		

Sex composition data		
0 (0.00%)	jacks	
120 (47.43%)	males	
133 (52.57%)	females	
253 (100.00%)	*total	

Age-class data		
0 (0.00%)	three-year-old	
247 (97.63%)	four-year-old	
6 (2.37%)	five-year old	
253 (100.00%)	total	

Age-class criteria		
< 59 cm =	three-year old	
59 – 85 cm =	four-year-old	
> 85 cm =	five-year-old	

This table includes all chinook released above Rapid River Trap.

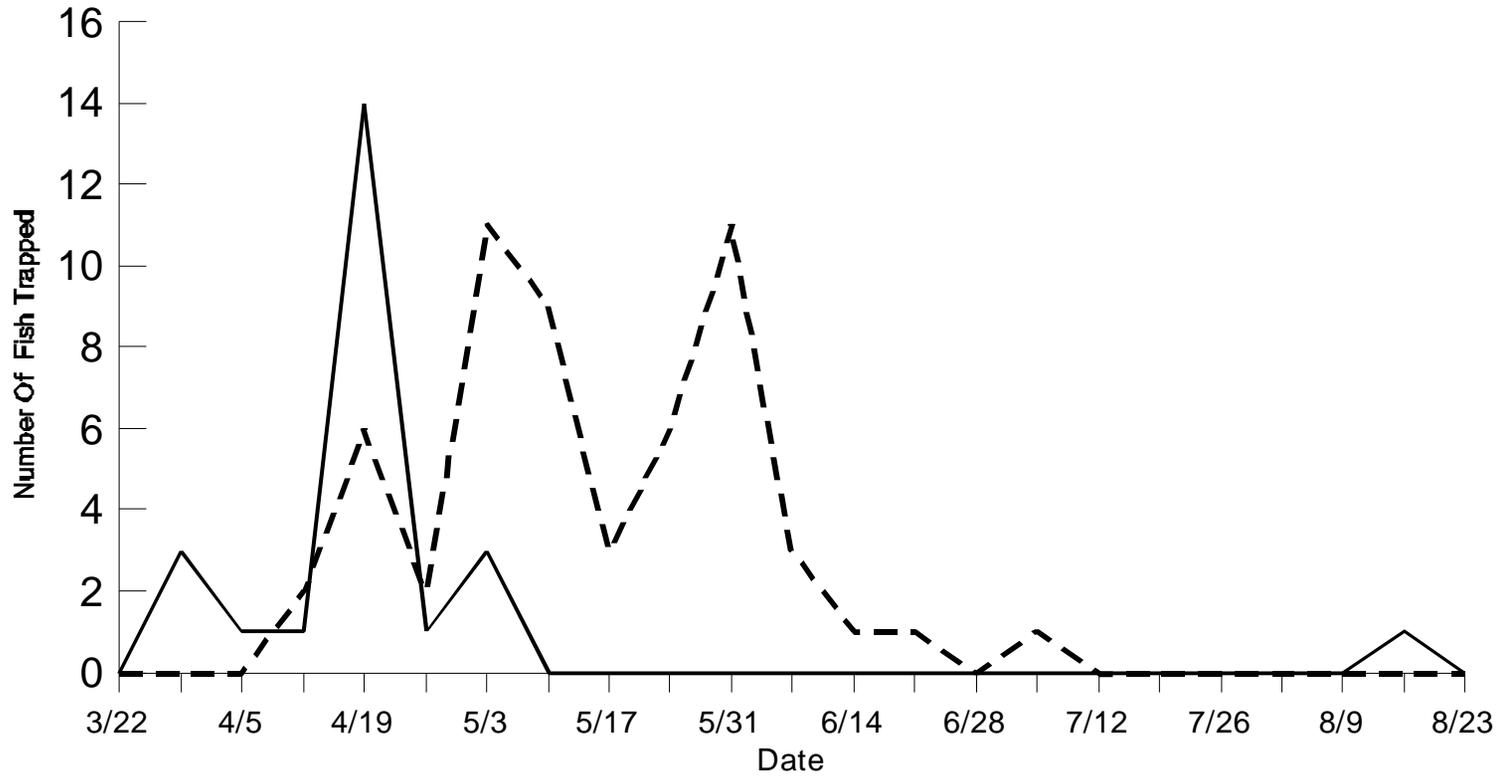
Appendix 19. Rapid River steelhead run timing for 1997.

Week ending	Number of hatchery fish	Percentage of steelhead run	Number of wild fish	Percentage of steelhead run
March 22	0	0.00	0	0.00
March 29	3	3.75	0	0.00
April 5	1	1.25	0	0.00
April 12	1	1.25	2	2.50
April 19	14	17.50	6	7.50
April 26	1	1.25	2	2.50
May 3	3	3.75	11	13.75
May 10	0	0.00	9	11.25
May 17	0	0.00	3	3.75
May 24	0	0.00	6	7.50
May 31	0	0.00	11	13.75
June 7	0	0.00	3	3.75
June 14	0	0.00	1	1.25
June 21	0	0.00	1	1.25
June 28	0	0.00	0	0.00
July 5	0	0.00	1	1.25
July 12	0	0.00	0	0.00
July 19	0	0.00	0	0.00
July 26	0	0.00	0	0.00
August 2	0	0.00	0	0.00
August 9	0	0.00	0	0.00
August 16	1	1.25	0	0.00
August 23	0	0.00	0	0.00
Total	24	30.00	56	70.00

Appendix 20. Adult steelhead returns to Rapid River during 1997.

WEEKLY TRAP COUNT

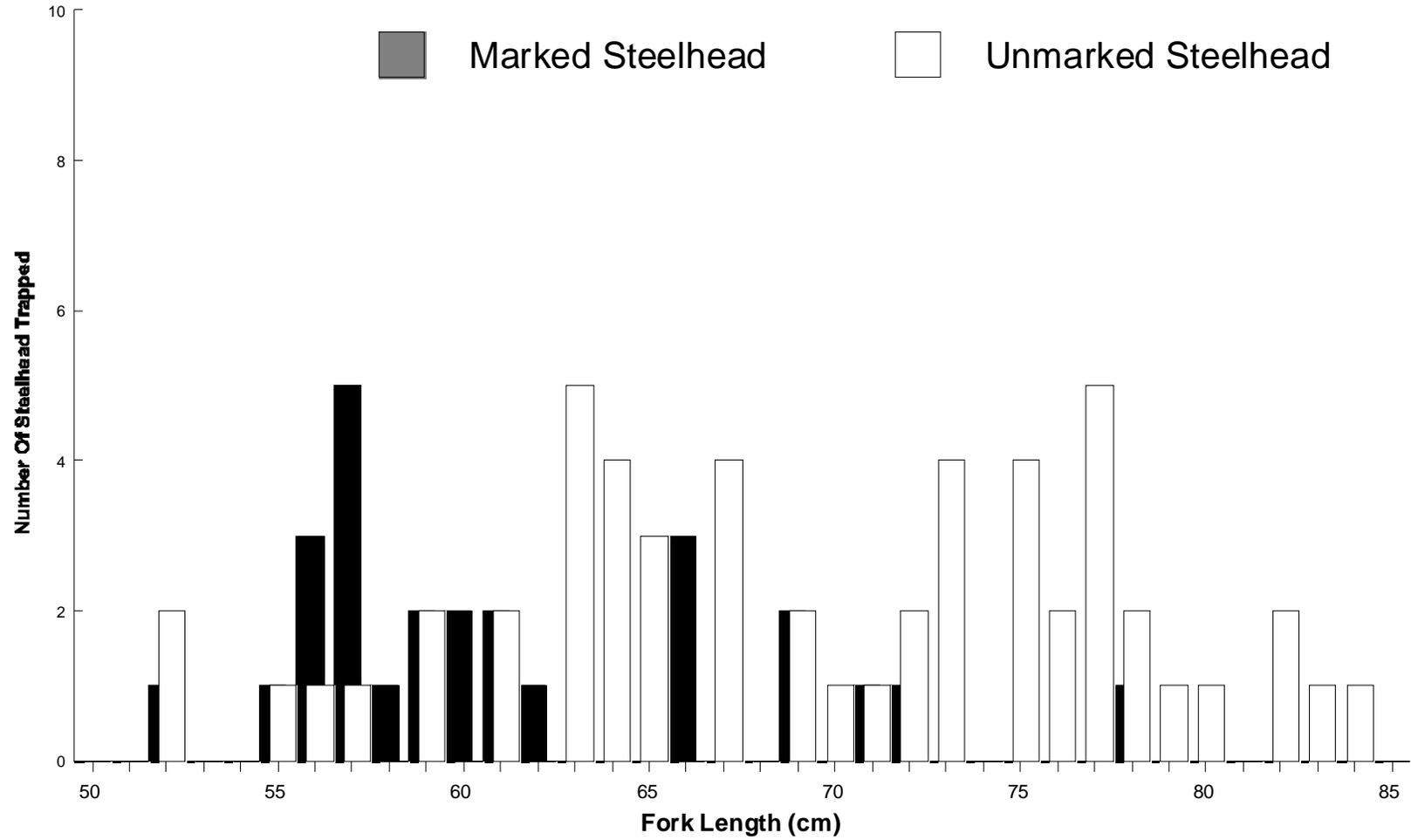
— Marked Steelhead
- - - Unmarked Steelhead



Appendix 21. Rapid River steelhead fork lengths for 1997.

Fork length (cm)	Hatchery		Wild	
	Male	Female	Male	Female
51				
52	1		2	
53				
54				
55	1			1
56	2	1		1
57	3	2	1	
58		1		
59	1	1		2
60	2			
61	2	1	1	
62	1			
63				5
64			2	2
65			1	2
66			2	1
67			1	3
68				
69	1	1	2	
70				1
71		1		1
72	1		1	1
73			1	3
74				
75			1	3
76			1	1
77			1	4
78		1		2
79				1
80				1
81				
82			1	1
83			1	
84				1
85				
86				
87				
88				
89				
column total	15	9	19	37
origin total		24		56
total run			80	

Appendix 22. Length-frequency of steelhead returning to Rapid River trap during 1997.

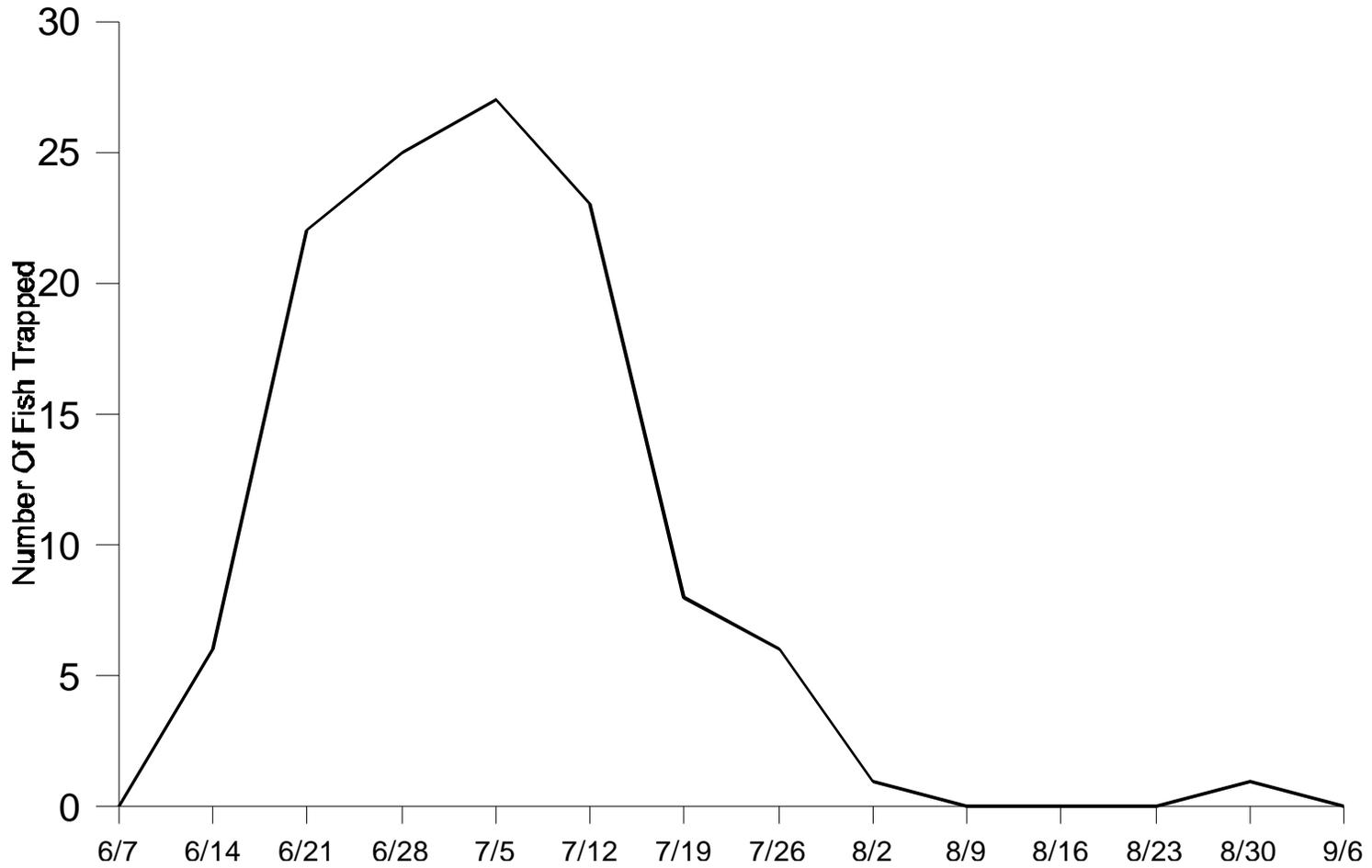


Appendix 23. Rapid River bull trout run timing for 1997.

Week ending	Number of fish	Percentage of bull trout run
June 7	0	0.00
June 14	6	5.04
June 21	22	18.49
June 28	25	21.01
July 5	27	22.69
July 12	23	19.33
July 19	8	6.72
July 26	6	5.04
August 2	1	0.84
August 9	0	0.00
August 16	0	0.00
August 23	0	0.00
August 30	1	0.84
September 6	0	0.00
Total	119	100.00

Appendix 24. Adult bull trout returns to Rapid River trap during 1997.

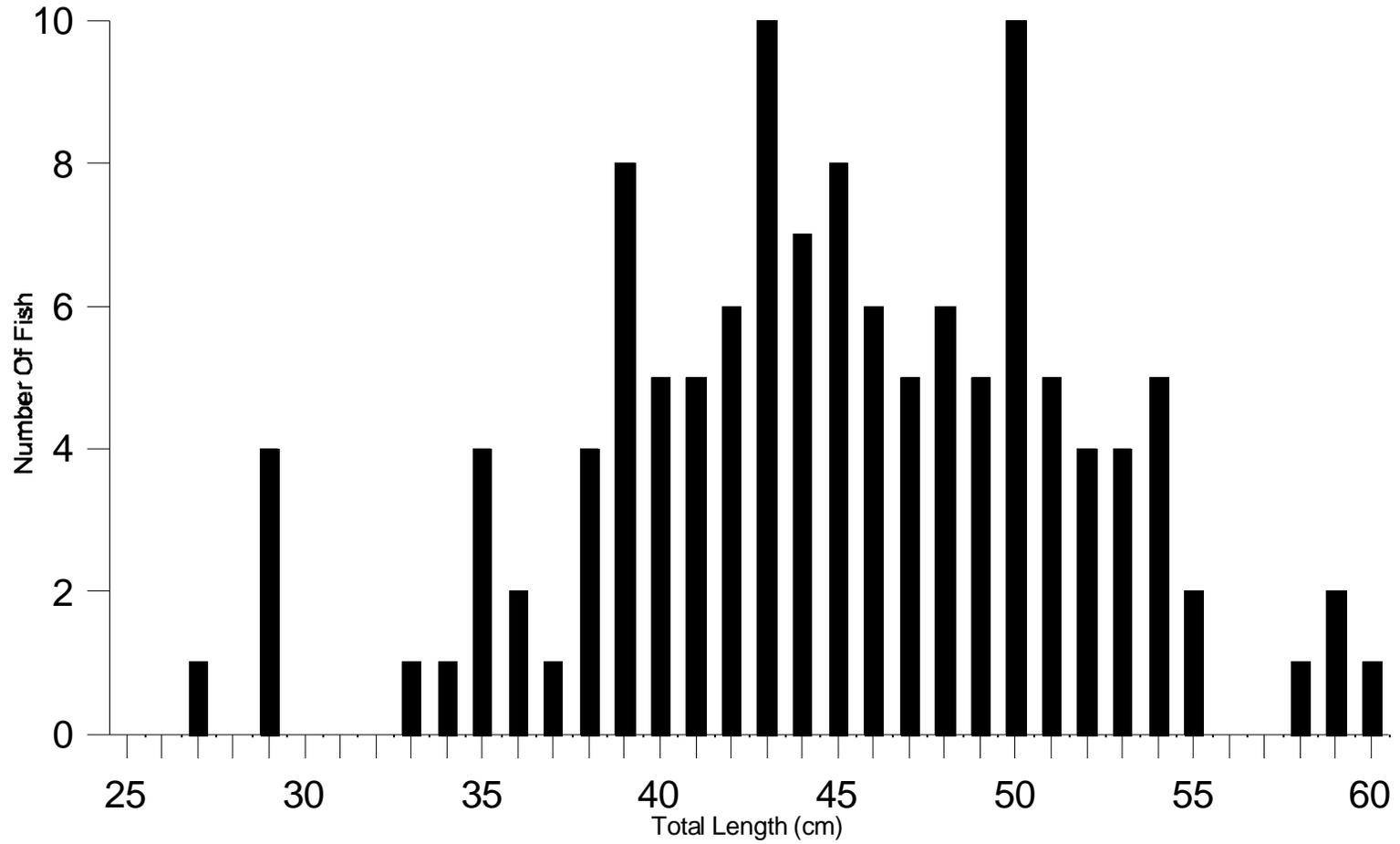
WEEKLY TRAP COUNTS



Appendix 25. Rapid River bull trout lengths for 1997.

Total length (cm)	Number of fish	Total length (cm)	Number of fish
21	0	41	5
22	0	42	6
23	0	43	10
24	0	44	7
25	0	45	8
26	0	46	6
27	1	47	5
28	0	48	6
29	0	49	5
30	0	50	10
31	0	51	5
32	0	52	4
33	1	53	4
34	1	54	5
35	4	55	2
36	2	56	0
37	1	57	0
38	4	58	1
39	8	59	2
40	5	60	1
Total			119

Appendix 26. Length-frequency of adult bull trout returning to Rapid River during 1997.



Appendix 27. Species trapped in Rapid River during 1997.

Species	Number trapped
Marked chinook	10,520
Unmarked chinook	253
Steelhead	80
Bull trout	119

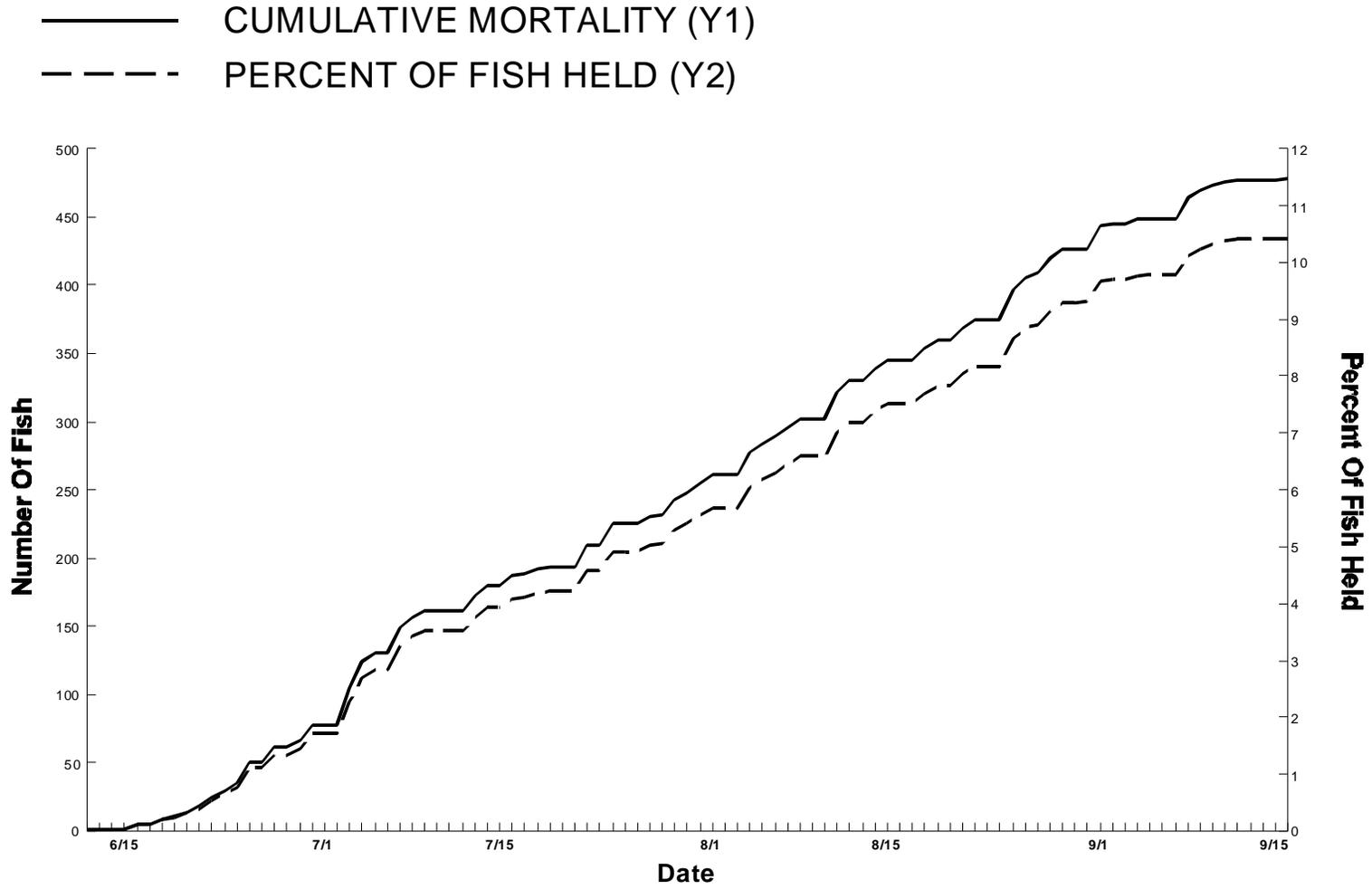
This table does not include recaptures.

Appendix 28. Causes of prespawning adult mortality at Rapid River Hatchery for 1997.

Cause	Number of fish	*Percentage of fish held
Nitrogen embolism		
25% of head	34	0.74
50% of head	29	0.63
75% of head	22	0.48
100% of head	143	3.12
% of embolism not recorded	40	0.87
Jaundice	4	0.09
Injury	1	0.02
Unknown	205	4.47
Total	478	10.42

*Percentages are of 4,588 fish placed in holding ponds.

Appendix 29. Cumulative prespawning adult mortality at Rapid River Fish Hatchery for 1997.



Appendix 30. Rapid River Hatchery egg enumeration for 1997.

Total eggs taken at Rapid River Hatchery in 1997.							
Lot	Spawn date	Eyed	Primary pick	Green	Percent eyed	Average fecundity	Females
R1	8/18	36,834	7,533	44,367	83.0	4,033	11
HC1	8/19	7,461	334	7,795	95.7	3,898	2
R2	8/21	112,107	7,023	119,130	94.1	3,843	31
HC2	8/22	38,151	1,052	39,203	97.3	3,920	10
R3	8/25	363,025	13,029	376,054	96.5	3,958	95
HC3	8/26	161,884	5,259	167,143	96.9	3,980	42
R4	8/28	436,350	13,035	449,385	97.1	3,942	114
HC4	8/29	320,160	23,177	343,337	93.2	4,039	85
R5	9/1	771,443	38,283	809,726	95.3	3,950	205
HC5	9/2	550,680	39,431	590,111	93.3	4,127	143
R6	9/4	410,635	44,635	455,270	90.2	3,959	115
HC6	9/5	426,562	27,841	454,403	93.9	3,755	121
R7	9/8	140,177	15,650	155,827	90.0	4,212	37
HC7	9/9	242,523	60,718	303,241	80.0	3,568	85
R8	9/11	42,056	2,085	44,141	95.3	4,013	11
HC8	9/12	73,079	8,376	81,455	89.7	3,542	23
HC9	9/16	28,642	3,343	31,985	89.5	3,998	8
Total		4,161,769	310,804	4,472,573	93.1	3,930	1138

Eggs transferred to Clearwater Hatchery in 1997.

Lot	Spawn date	Eyed	Primary pick	Green	Percent eyed	Average fecundity	Females
R5	9/1	263,576	18,945	282,521	93.3	3,870	73
R6	9/4	200,577	9,911	210,488	95.3	3,898	54
HC6	9/5	136,200	9,230	145,430	93.7	3,636	40
R7	9/8	140,177	15,650	155,827	90.0	4,212	37
HC7	9/9	206,467	59,147	265,614	77.7	3,542	75
HC8	9/12	68,499	8,027	76,526	89.5	3,478	22
Total		1,015,496	120,910	1,136,406	89.4	3,775	301

Eggs transferred to Clearwater Hatchery were picked prior to shipment and again on arrival. The primary pick numbers here include both pick off. The number of females listed includes 5 females incubated at OFH that produced only blank eggs. Their eggs are included as primary pick. CFH received eyed eggs from 296 females.

Appendix 30. (Continued).

Eggs reared at Rapid River Hatchery in 1997.							
Lot	Spawn date	Eyed	Primary pick	Green	Percent eyed	Average fecundity	Females
R1	8/18	36,834	7,533	44,367	83.0	4,033	11
HC1	8/19	7,461	334	7,795	95.7	3,898	2
R2	8/21	112,107	7,023	119,130	94.1	3,843	31
HC2	8/22	38,151	1,052	39,203	97.3	3,920	10
R3	8/25	363,025	13,029	376,054	96.5	3,958	95
HC3	8/26	161,884	5,259	167,143	96.9	3,980	42
R4	8/28	436,350	13,035	449,385	97.1	3,942	114
HC4	8/29	320,160	23,177	343,337	93.2	4,039	85
R5	9/1	507,867	19,338	527,205	96.3	3,994	132
HC5	9/2	550,680	39,431	590,111	93.3	4,127	143
R6	9/4	210,058	34,724	244,782	85.8	4,013	61
HC6	9/5	290,362	18,611	308,973	94.0	3,814	81
HC7	9/9	36,056	1,571	37,627	95.8	3,763	10
R8	9/11	42,056	2,085	44,141	95.3	4,013	11
HC8	9/12	4,580	349	4,929	92.9	4,929	1
HC9	9/16	28,642	3,343	31,985	89.5	3,998	8
Total		3,146,273	189,894	3,336,167	94.3	3,986	837

The tables in this appendix do not include females or eggs that were culled.

Appendix 31. Rapid River broodstock ELISA results.

*Lot number	Date sampled	Number sampled	Negative		Positive	
			< 0.999	Low .1-.249	Moderate .250-.399	High > .400
R1	8/18	15	0	10	1	4
HC1	8/19	2	2	0	0	0
R2	8/21	43	0	24	7	12
HC2	8/22	11	2	7	1	1
R3	8/25	123	0	63	32	28
HC3	8/26	45	3	37	2	3
R4	8/28	147	7	93	15	32
HC4	8/29	94	22	61	2	9
R5	9/1	257	13	179	26	39
HC5	9/2	158	64	72	6	16
R6	9/4	141	12	103	9	17
HC6	9/5	139	84	42	2	11
R7	9/8	79	0	53	10	16
HC7	9/9	96	50	40	0	6
R8	9/11	17	0	10	3	4
HC8	9/12	27	12	12	2	1
HC9	9/16	8	4	4	0	0
Total		1402	275	810	118	199

*Lot numbers with HC denote mixed Rapid River and Snake River returns.

Appendix 32. Rapid River Hatchery initial raceway loading densities (1/5/98–4/13/98).

Raceway	Inflow (ft ³ /s)	Number of fish	Weight (lb)	Density index	Flow index
2	0.5	339,132	224	0.46	0.88
3	0.5	339,174	239	0.45	0.86
4	0.5	339,203	247	0.45	0.87
5	0.5	336,464	237	0.45	0.86
6	0.5	337,889	238	0.45	0.86
7	0.5	340,116	240	0.45	0.87
8	0.5	339,762	269	0.48	0.92
9	0.9	338,002	425	0.66	0.69
10	0.9	337,671	328	0.55	0.57

Inventory data are based on egg enumeration values when final fish were added to each raceway.

Appendix 33. Rapid River Hatchery final raceway loading densities (6/12/98).

Raceway	Inflow (ft ³ /s)	Number of fish	Weight (lb)	Density index	Flow index
2	1.4	336,308	2,669	0.58	1.51
3	1.4	336,694	2,457	0.55	1.39
4	1.4	337,018	2,392	0.54	1.41
5	1.4	334,354	2,182	0.51	1.32
6	1.4	336,337	2,321	0.53	1.38
7	1.4	337,182	2,133	0.50	1.30
8	1.4	336,749	2,116	0.50	1.30
9	1.4	336,724	1,626	0.42	1.09
10	1.4	335,172	1,027	0.31	0.80
11	1.4	218,646	1,258	0.31	0.79

Inventory data are based on egg enumeration values minus documented mortality; they differ slightly from the number reported marked.

Raceway 11 contained fish returned to RRFH from CFH.

Appendix 34. Rapid River Hatchery initial pond loading densities (6/25/98).

Pond	Inflow (ft ³ /s)	Number of fish	Weight (lb)	Density index	Flow index
RP-1A	6.7	616,519	4,934	0.06	0.57
RP-1B	5.9	616,500	4,934	0.06	0.65
RP-2A	5.9	445,329	3,564	0.05	0.47
RP-2B	5.9	486,000	3,889	0.06	0.51
RP-2C	5.9	486,390	3,892	0.06	0.51
RP-2D	5.9	484,097	3,725	0.06	0.50
RACEWAY 11	1.4	218,646	1,258	0.31	0.79

Inventory data are based on reported number marked, which shows an increase of 3.58% from hatchery inventory based on egg enumeration.

Raceway 11 fish were isolated after transfer from CFH and distributed among the rearing ponds 8/17/98.

Appendix 35. Rapid River Hatchery pond loading densities at release (3/18/99).

Pond	Inflow (ft ³ /s)	Number of fish	Weight (lb)	Density index	Flow index
RP-1A	8.3	636,738	36,594	0.25	1.81
RP-1B	8.3	636,614	35,172	0.24	1.75
RP-2A	7.4	491,022	29,580	0.23	1.66
RP-2B	7.4	517,459	27,379	0.23	1.56
RP-2C	8.0	529,893	28,489	0.23	1.45
RP-2D	8.0	535,557	24,566	0.20	1.33

Appendix 36. Feed for brood year 1997 at Rapid River Hatchery.

Product		^a Amount used	Unit price	Total cost
Type/size	Additives			
BioDiet:				
No. 2 Starter		660.0kg	2.2300	\$1,468.68
No. 3 Starter		878.1kg	2.2300	\$1,958.16
1.0 mm Grower		1916.0kg	1.7500	\$3,353.00
1.0 mm Grower	Aquamycin-100	279.4kg	3.4600	\$ 968.80
1.3 mm Grower		358.0kg	1.7100	\$ 612.18
1.3 mm Grower	Aquamycin-100	2734.2kg	1.5900	\$4,347.38
1.5 mm Grower		2734.2kg	1.5900	\$4,347.38
1.5 mm Grower	Aquamycin-100	1358.1kg	3.4600	\$4,695.57
2.0 mm Grower	TM-100	319.3kg	2.8500	\$ 912.00
BioMoist:				
1.5 mm Grower	^b EIBS PAC	6500.0lb	0.7450	\$4,842.50
2.0 mm Grower	EIBS PAC	42500.0lb	0.7350	\$31,237.50
2.5 mm Grower		10000.0lb	0.4300	\$4,300.00
2.5 mm Grower	EIBS PAC	24150.0lb	0.6450	\$15,576.75
3.0 mm Grower	EIBS PAC	111100.0lb	0.4950	\$54,994.50
3.0 mm Feed	Aquamycin-100	25900.0lb	1.7900	\$46,361.00
	EIBS PAC			
3.0 mm Feed	Aquamycin-100	9000.0lb	1.7400	\$15,225.00
	EIBS PAC			
Total		253,923.8lb		\$172,537.25

^aFeed units are given in kg or lb. as provided by manufacturer

^bEIBS PAC = 5 x C and B12, and 10 x Folic Acid.

Appendix 37. Eagle Fish Health Laboratory inspection results for brood year 1997

RpdRvrvBY97.doc

Brood year stock	Log number	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	WHD	CSH	Comments
Juvenile samples											
RRSC	98-30	-	-								NO PATHOGENS DETECTED; VIRO 0/10
RRSC	98-164	-	-		+	-	-	-			RS; VIRO 0/10, BACTE-NSG
RRSC	98-189				+	-	-	-			RS, BACTERIMNA; FAT 1/10, AEROMONAS SOBRIA 1/8, A. CAVIAE 1/8, PSEUDOMONAS CHLORAPHIS 1/8,(ONE COLONY OF EACH)
RRSC	98-238	-	-		-	-	-	+			MAS, CWD; VIRO 0/10, FLAVOBACTERIUM PSYCHROPHILUM 2/4. AREOMONAS HYDROPHILA 1/4
RRSC	98-361				-	-	-	+			MAS CWD; FAT 0/10, AEROMONAS HYDROPHILA 6/8, FLAVOBACTERIUM PSYCROPHILUM 4/8
RRSC	99-011				-	-	-	-			NO PATHOGENS DETECTED; FAT 0/10, BACTE 0/4
RRSC	99-048	-	-	-	-				-		MYXOBOLUS 2/4 (x5 ; RS; VIRO 0/20, EIBS 0/10, FAT 0/20, ELISA 4/4 (X58, O.D.=0.179, 0.184, 0.194, 0.342), WHD 0/20, MYXOBOLUS; EIBS 0/20, FAT 0/20, ELISA
Brood samples											
RRSC	97-239	-	-		+						BKD; VIRO 0/15, ELISA 15/15 (10LOW, 5HIGH)
RRSC	97-240								-		NO PATHOGENS DETECTED; WHD 0/20
RRSC	97-243	-	-		-						NO PATHOGENS DETECT`ED; VIRO 0/2, ELISA 0/2
RRSC	97-256	-	-		+						BKD; VIRO 0/43, ELISA 43/43 (24 LOW, 19 HIGH)
RRSC	97-258				+						BKD; ELISA 9/11 (7 IOW, 2 HIGH)
RRSC	97-261				+						BKD; ELISA 123/123 (63 LOW, 60 HIGH)
RRSC	97-262				+						BKD; ELISA 42/45 (37 LOW, 3 HIGH)
RRSC	97-276				+						BKD; ELISA 140/147 (104 LOW, 36 HIGH)
RRSC	97-277				+						BKD; ELISA 72/94 (63 LOW, 9 HIGH)
RRSC	97-279				+						BKD; ELISA 244/257 (205 LOW, 39 HIGH)
RRSC	97-284				+						BKD; ELISA 94/158 (78 LOW, 16 HIGH)
RRSC	97-282				+						BKD; ELISA 129/141 (112 LOW, 17 HIGH)
RRSC	97-293				+						BKD; ELISA 55/139 (44 LOW, 11 HIGH)
RRSC	97-298				+						BKD; ELISA 79/79 (63 LOW, 16 HIGH)
RRSC	97-299				+						BKD; ELISA 46/96 (40 LOW, 6 HIGH)
RRSC	97-312				+						BKD; ELISA 17/17 (13 LOW, 4 HIGH)
RRSC	97-316				+						BKD; ELISA 15/27 (14 LOW, 1 HIGH)
RRSC	97-317				+						BKD; ELISA 4/8 (4 LOW)

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Appendix 38. Preliberation organosomatic index for brood year 1997.

Hematology						
Date	Hematocrit			Serum protein		
	^a Mean	^a SD	^b CF	^a Mean	^b SD	^c CF
03/11/99	NA	NA	NA	NA	NA	NA

^aStandard deviation

^bCoefficient of variation

Combined autopsy summary

Eyes		Gills		Pseudo-branches		Thymus		Mesen. fat		Spleen		Hind gut		Kidney		Liver		Bile	
N	20	N	20	N	20	0	20	0	0	B	0	0	20	N	20	A	0	0	0
B1	0	F	0	S	0	1	0	1	0	R	20	1	0	S	0	B	20	1	0
B2	0	C	0	L	0	2	0	2	7	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	8	ON	0			G	0	D	0	3	0
E2	0	P	0	I	0			4	5	E	0			U	0	E	0		
H1	0	OT	0	OT	0					OT	0			T	0	F	0		
H2	0			O	0											OT	0		
M1	0																		
OT	0																		

Summary of normals

20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

N = normal

OT = other

Thymus: 0 = no hemorrhage

Mesenteric fat: 0 = none, 1 = < 50% coverage, 2 = 50%, 3 = > 50%, 4 = 100%

Spleen: R = red, E = enlarged (EIBS enlarges spleens)

Hind gut: 0 = no inflammation

Liver: B = pail red

Bile: 0 = yellow bile < full bladder

Appendix 39. Rapid River Hatchery marking summary for brood year 1997.

Coded wire tag releases						
Release site	Date released	^{a,b} Number of fish marked	Release group mark code	Clip	Purpose	Pond
Rapid River	3/18/-4/26/99	54,450	10-32-19	AD	US-Canada	1A
Rapid River	3/18/-4/26/99	56,793	10-35-33	AD	US-Canada	1A
Rapid River	3/18/-4/26/99	54,129	10-51-33	AD	US-Canada	1A
Rapid River	3/18/-4/26/99	55,817	10-35-22	AD	US-Canada	1B
Rapid River	3/18/-4/26/99	56,924	10-35-23	AD	US-Canada	1B
Rapid River	3/18/-4/26/99	55,661	10-35-24	AD	US-Canada	1B
Rapid River	3/18/-4/26/99	451,147	AD only	AD	US-Canada	1A
Rapid River	3/18/-4/26/99	448,098	AD only	AD	US-Canada	1B
Rapid River	3/18/-4/26/99	1,401,816	AD only	AD	Hatchery ID	2ABCD
Little Salmon	3/17/99	200,000	AD only	AD	Hatchery ID	2D
Hells Canyon	3/18-19/99	300,000	AD only	AD	Hatchery ID	2D

^a Number of fish marked does not include AD only fish received from CFH.

PIT tag releases						
Release site	Date released	^b Number of fish PIT-tagged	Release group mark code	Clip	Purpose	Pond
Rapid River	3/18-4/26/99	47,851	AD only	AD	Hatchery PIT tag study and FPC	2B 2C
Rapid River	4/20-22/99	1,500	See 1B above	AD	Antenna test	1B

^b See the *Annual Release Summary of Marked Salmon and Steelhead* (unpublished Department document) for estimated numbers of marked fish released.

Appendix 40. Smolts released from Rapid River Hatchery in 1999 (brood year 1997).

Release site date	Release method	Number released	Weight (lb)
<u>Rapid River</u>			
3/18-4/19/99	Volitional release by pond:		
	1A	541,227	31,105
	1B	541,122	29,896
	2A	417,369	25,143
	2B	439,840	23,272
	2C	450,409	24,216
	2D	30,235	1,387
	Volitional release Subtotal	2,420,202	135,019
4/19-4/26/99	Smolts flushed by pond:		
	1A	95,511	5,489
	1B	95,492	5,276
	2A	73,653	4,437
	2B	77,619	4,107
	2C	79,484	4,273
	2D	5,322	244
	Pond flush subtotal	427,081	23,826
Site total	Site total	2,847,283	158,845
<u>Little Salmon River</u>			
3/17/99	Number released	200,000	9,174
	Site total	200,000	9,174
<u>Snake River</u>			
3/18-19/99	Number released	300,000	13,761
	Site total	300,000	13,761
	Hatchery total	3,347,283	181,780

Appendix 41. Survival from eggs to smolts at Rapid River Hatchery for brood year 1997.

^a Green eggs	Eyed egg number	Percent survival	Swimup	^b Percent survival	^c Marked number	^d Released smolts	^e Percent survival
3,336,167	3,146,273	94.3	3,070,687	92.0	3,134,835	3,347,283	99.9

^aGreen eggs retained by Rapid River Hatchery after segregation of green eggs for transfer to CFH.

^bPercentage of all eggs hatched at Rapid River Hatchery that survived to swim-up.

^cThe reported number marked was 3.58% more than hatchery inventory at the time of marking.

^dThe number of fish released includes fish received from CFH.

^ePercentage of fish that survived to release. Includes fish received from CFH.

Appendix 42. Cost of production at Rapid River Hatchery for brood year 1997.

Number of fish	Weight of fish (lb)	Weight of feed (lb)	Cost of feed	Feed conversion	^a Total cost	Cost/ thousand fish	^b Cost/ pound
3,347,283	181,780	253,923.8	\$172,237.25	1.40	\$879,292.29	\$262.69	\$4.84

^aThe total represents the total cost incurred by IPC from 9/1/97 through 3/31/99. This amount may exceed cost associated with production of Brood Year 1997 due to overlap in the brood year rearing cycle (see discussion in the Cost of Production section). These costs include funds provided to the Department by IPC, as well as internal costs incurred by IPC.

^bCost/pound is included for comparison with previous years.

Appendix 43. Returns to Rapid River Hatchery, 1964–1998.

Return year	Snake R. return (adults)	Rapid R. return (adults)	Rapid R. return (jacks)	Percent prespawning mortality	Females spawned	Eggs/female	Number of eggs taken
1964	349			16	182	4,874	887,000
1965	408			21	133	4,541	604,000
1966	1,5111			18	621	3,697	2,296,000
1967	974	1,039		11	581	3,537	2,055,000
1968	351	3,416	740	2	1,809	3,671	6,540,000
1969	672	2,817	1,043	8	1,415	3,655	5,151,697
1970		6,470	887	10	3,520	4,136	14,560,280
1971		3,357	1,754	19	1,722	3,507	6,038,785
1972		12,310	943	15	3,825	3,941	15,072,604
1973		17,054	286	37	3,454	3,912	13,510,465
1974		3,457	538	27	1,756	3,924	6,890,186
1975		4,428	573	7	2,184	3,894	8,503,606
1976		6,342	1,765	15	3,055	3,762	11,492,878
1977		7,767	437	11	3,781	3,745	14,160,330
1978		5,735	34	21	2,350	4,266	10,026,888
1979		3,054	350	31	1,141	4,950	5,648,722
1980		1,528	432	30	543	3,235	1,756,827
1981		3,087	176	7	1,666	3,675	6,122,273
1982		3,646	30	11	1,883	3,973	7,482,330
1983		1,864	94	15	859	4,015	3,449,471
1984		1,705	651	7	821	3,807	3,125,911
1985	673	6,376	351	8	2,962	3,741	11,535,461
1986	360	6,546	177	34	2,451	4,355	10,673,138
1987	534	3,808	210	30	1,133	4,379	5,656,145
1988	381	3,608	172	19	1,645	4,879	7,905,702
1989	86	2,372	428	11	1,082	4,139	4,478,045
1990		2,566	40	13	1,063	3,967	4,217,103
1991		1,675	238	10	657	3,886	2,553,218
1992	912	2,370	96	24	1,177	3,988	4,534,404
1993	411	4,451	17	17	1,737	4,090	6,404,312
1994	29	261	4	21	116	4,226	490,249
1995	35	70	59	7	35	3,771	132,002
1996	58	1,412	751	6	329	3,561	1,171,610
1997	788	10,510	10	10	1,138	3,930	4,472,573
1998	60	1,584	7	16	723	4,715	3,409,130

From 1985 on, total eggs taken includes those from Snake River adults.

Appendix 44. Returns to Rapid River Hatchery by brood year.

Brood year	Year released	Number released	3-year-olds	Year returned	4-year-olds	Year returned	5-year-olds	Year returned	Return from release	% Return from release
1964	1966	588,000	1,309	1967	3,422	1968	197	1969	4,928	0.84
1965	1967	479,267	740	1968	2,620	1969	874	1970	4,234	0.88
1966	1968	1,460,150	1,043	1969	5,596	1970	364	1971	7,003	0.48
1967	1969	900,192	887	1970	2,992	1971	1,544	1972	5,423	0.60
1968	1970	3,172,000	1,754	1971	10,766	1972	4,403	1973	16,923	0.53
1969	1971	2,718,720	943	1972	12,654	1973	1,759	1974	15,356	0.56
1970	1972	2,809,200	285	1973	1,698	1974	386	1975	2,369	0.08
1971	1973	2,908,425	538	1974	4,206	1975	1,120	1976	5,864	0.20
1972	1974	2,707,917	573	1975	5,222	1976	634	1977	6,429	0.24
1973	1975	3,373,700	1,765	1976	7,110	1977	1,845	1978	10,720	0.32
1974	1976	3,358,940	437	1977	3,890	1978	2,413	1979	6,740	0.20
1975	1977	2,921,172	34	1978	598	1979	46	1980	678	0.02
1976	1978	2,412,678	350	1979	1,482	1980	146	1981	1,978	0.08
1977	1979	2,866,993	432	1980	3,068	1981	557	1982	4,057	0.14
1978	1980	2,604,823	176	1981	3,089	1982	1,206	1983	4,471	0.17
1979	1981	2,372,607	30	1982	838	1983	356	1984	1,224	0.05
1980	1982	1,476,766	94	1983	1,349	1984	199	1985	1,642	0.11
1981	1983	2,998,103	651	1984	6,177	1985	1,456	1986	8,284	0.28
1982	1984	3,246,197	351	1985	5,090	1986	1,155	1987	6,596	0.20
1983	1985	2,491,238	177	1986	2,444	1987	1,557	1988	4,178	0.17
1984	1986	1,594,688	210	1987	2,051	1988	379	1989	2,640	0.17
1985	1987	2,836,400	172	1988	1,933	1989	135	1990	2,240	0.08
1986	1988	2,630,200	428	1989	2,431	1990	421	1991	3,280	0.12
1987	1989	2,319,500	40	1990	1,254	1991	161	1992	1,455	0.06
1988	1990	2,520,400	238	1991	2,209	1992	1,905	1993	4,352	0.17
1989	1991	2,564,900	96	1992	2,546	1993	122	1994	2,764	0.11
1990	1992	2,615,500	17	1993	139	1994	9	1995	165	0.006
1991	1993	2,060,300	4	1994	61	1995	2	1996	67	0.003
1992	1994	2,928,146	59	1995	659	1996	177	1997	895	0.03
1993	1995	3,286,455	751	1996	10,333	1997	1,322	1998	12,406	0.38
1994	1996	379,167	10	1997	262	1998		1999	272	0.072
1995	1997	85,840	7	1998		1999		2000	0	0.00
1996	1998	896,170		1999		2000		2001	0	0.00
1997	1999	3,347,283		2000		2001		2002	0	0.00

Appendix 45. Average feed and growth data for Rapid River Hatchery.

Month	Average water temperature (°F)	Density index	Flow index	^a Feed conv.	Hatchery constant	^b Daily length increase (in)	^b Monthly length increase (in)	Condition factor C (x10 ⁴)	Percent body weight fed	Number feedings per day	Average size (fish/lb)	Average length at end of month (in)
FEB	38	N.A.	N.A.	N.A.	1.98	0.0024	0.07	2.7	1.42	8	1109	1.50
MAR	41	0.24	0.59	1.07	2.26	0.0070	0.20	2.8	1.89	8	809	1.64
APR	44	0.29	0.64	1.02	3.23	0.0105	0.34	3.1	2.40	8	439	1.95
MAY	46	0.29	0.74	1.00	4.54	1.0151	0.29	3.1	2.30	8	271	2.29
JUN	49	0.0	0.69	1.20	7.10	0.0297	0.59	3.1	2.93	4	136	2.87
JUL	54	0.09	0.83	1.59	7.36	0.0155	0.47	3.6	2.75	4	79	3.43
AUG	55	0.12	1.33	1.59	7.82	0.0164	0.50	3.5	2.70	5	46	3.86
SEP	51	0.15	1.57	1.70	8.66	0.0170	0.51	3.5	2.00	5	36	4.31
OCT	46	0.16	1.69	1.71	5.03	0.0098	0.30	3.5	1.37	3	30	4.60
NOV	51	0.17	1.81	2.22	1.54	0.0023	0.07	3.5	0.47	2	28	4.67
DEC	38	0.17	1.88	4.46	2.12	0.0016	0.03	3.4	0.21	1	30	4.67
JAN	37	0.18	1.89	2.83	1.15	0.0013	0.03	3.4	0.21	1	29	4.69
FEB	38	0.18	2.01	1.24	1.47	0.0040	0.12	3.2	0.53	2	26	4.95
MAR	41	0.19	1.97	1.55	3.47	0.0074	0.22	3.2	0.92	2	22	5.19

^aFeed conversion is expressed as actual feed weight over weight gain.

^bGrowth data may vary during periods of high water.

Appendix 46. Release and transfer summary for Rapid River Hatchery, 1964–1997.

Brood year	No. eggs taken	Egg or fry plants and site		Smolt plants and site		Size (fish/lb)
1964	887,000	None		588,000	Rapid River	22.6
1965	60,400	None		479,267	Rapid River	23.2
1966	2,296,000	None		1,460,150	Rapid River	25.0
1967	2,055,000	None		900,192	Rapid River	24.0
1968	6,540,000	757,376	eggs Clearwater H Channel	3,172,000	Rapid River	20.0
1969	5,171,697	497,000	eggs Dworshak NFH to start	2,718,720	Rapid River	21.0
1970	14,560,280	4,417,454	eggs Sweetwater Eye Stat.	2,809,200	Rapid River	19.4
		2,224	eggs Kooskia NFH.	91,800	Lochsa River	19.4
		526,516	eggs Hayden Cr. Hatchery			
		2,473,983	eggs Clearwater H Channel			
		4,607,736	eggs Rapid River Hatchery			
		200,520	fry Lemhi River			
		353,970	fry Decker Pond			
		100,000	fry Sandpoint Hatchery			
1971	6,038,785	600,000	eggs Hayden Cr. Hatchery	2,908,425	Rapid River	17.0
		53,562	fry Lemhi River	197,303	SF Clearwater	
		104,300	fry Red River			
		29,800	fry Ten Mile Creek			
		44,700	fry American River			
		14,900	fry Papoose Creek			
		59,600	fry Brushy Creek			
		44,700	fry Fish Creek			
		14,900	fry Post Office Creek			
		44,700	fry Squaw Creek (Lochsa)			
		61,500	fry Lochsa River			
		60,000	fry Ten Mile Creek			
		200,000	fry Sandpoint Hatchery			
		401,305	fry Decker Pond			
1972	15,072,604	5,256,662	eggs Sweetwater Eye Stat.	2,707,917	Rapid River	17.5
		3,012,358	eggs Hayden Creek Hatchery			
		1,293,592	eggs Red River H Channel			
1973	13,510,464	3,915,900	eggs Sweetwater Eye Stat.	3,373,700	Rapid River	14.8
		1,295,424	eggs Hayden Creek Hatchery	117,000	SF Clearwater	
		104,760	eggs Hagerman Hatchery			
		502,200	eggs Crooked R. H Channel			
		702,000	eggs Kooskia NFH			
		806,400	eggs Hayden Creek Hatchery			
		504,000	eggs Minnesota walleye trade			
		210,734	fry Sandpoint Hatchery			
		206,360	fry Kooskia NFH			
		88,480	fry Ten Mile Creek.			
		18,200	fry Newsome Creek			
		633,000	fry Lemhi River			
		10,428	fry Capehorn Creek			
1974	6,890,186	809,400	eggs Hayden Creek Hatchery	3,358,940	Rapid River	18.4
		407,012	eggs Indian Creek	205,700	SF Clearwater	
		203,500	fry Sandpoint Hatchery			
		21,840	fry Capehorn Creek			
		59,962	fry Red River			
		30,750	fry Newsome Creek			
		10,250	fry Ten Mile Creek			
		1,140,300	fry Lemhi River			

Appendix 46. (Continued).

Brood year	No. eggs take	Egg or fry plants and site			Smolt plants and site		Size (fish/lb)			
1975	8,503,606	2,363,200	eggs	Sweetwater Eye Stat.	2,921,172	Rapid River	15.9			
		252,200	eggs	Mullan Hatchery				249,750	SF Clearwater	
		255,000	eggs	Hayden Creek Hatchery						
		280,659	eggs	Indian Creek H Chan.						
		4,906,492	eggs	Rapid River Hatchery						
		34,000	fry	Ten Mile Creek						
		156,000	fry	Lemhi River						
		65,960	fry	SF Clearwater River						
		412,800	fry	Decker Pond						
		209,950	fry	Sandpoint Hatchery						
		36,143	fry	Bear Valley Creek						
		1976	11,492,878	1,161,608	eggs	Mullan Hatchery		2,413,678	Rapid River	15.7
				2,937,994	eggs	Sweetwater Eye Stat.				
261,900	eggs			Hayden Creek Hatchery						
261,900	eggs			Sandpoint Hatchery						
1,267,208	eggs			Mackay Hatchery						
47,008	fry			Univ. of Idaho						
3,111,850	fry			Mackay Hatchery						
104,500	fry			Lolo Creek						
501,600	fry			Red River Pond						
80,600	fry			SF Clearwater						
1977	14,160,330	2,633,400	eggs	Sweetwater Eye Stat.	2,866,993	Rapid River	15.0			
		2,287,800	eggs	Kooskia NFH				156,362	White Sand Cr.	
		2,689,000	eggs	Mullan Hatchery				44,373	Newsome Creek	
		288,000	eggs	Hayden Creek Hatchery						
		20,700	eggs	Univ. of Idaho						
		1,007,340	eggs	Crooked River H Chan.						
		723,000	fry	Mackay Hatchery						
		50,800	fry	Decker Pond						
		200,025	fry	Red River Pond						
		265,600	fry	Lemhi River						
1978	10,026,888	767,322	eggs	Hayden Creek Hatchery	2,604,823	Rapid River	15.0			
		970,728	eggs	Mackay Hatchery				57,440	White Sand Cr.	
		1,540,282	eggs	Sweetwater Eye Stat.						
		706,936	eggs	Dworshak NFH						
		38,160	eggs	Univ. Of Idaho						
		10,864	eggs	U of I Hayden Cr.						
		1,250,010	eggs	Crooked River H Chan.						
		249,696	eggs	Sweetwater Eye Stat.						
		232,500	fry	Red River Pond						
		10,000	fry	Ten Mile Creek						
1979	5,646,722	806,400	eggs	Hayden Creek Hatchery	2,372,607	Rapid River	17.9			
		330,880	eggs	Dworshak NFH				1,001,700	Snake River	
		293,249	fry	Red River Pond						
1980	1,756,827	None		1,473,733	Rapid River	28.0				
1981	6,122,273	608,384	eggs	Pahsimeroi Hatchery	2,998,103	Rapid River	22.0			
		256,608	eggs	Oxbow Hatchery				250,020	Snake River	
		449,280	eggs	Dworshak NFH						
1982	7,420,450	493,346	eggs	Looking Glass (Ore)	3,246,197	Rapid River	20.0			
		1,332,200	eggs	Pahsimeroi Hatchery				500,850	Snake River	
		375,028	eggs	Dworshak NFH						
		125,055	eggs	Hagerman NFH						
		306,000	fry	Red River Pond						

Appendix 46. (Continued).

Brood year	No. eggs taken	Egg or fry plants and site			Smolt plants and site		Size (fish/lb)		
1983	3,449,471	None			2,491,238	Rapid River	23.0		
					437,360	Snake River	27.0		
1984	3,125,911	152,000	fry	Red River	159,688	Rapid River	22.0		
					140,000	Snake River	20.0		
					136,000	Red River	30.0		
					2,630,200	Rapid River	22.5		
1985	11,535,461	497,520	eggs	Oregon	103,000	Snake River	31.1		
		3,668,000	eggs	Dworshak NFH					
		2,450,907	eggs	Sawtooth Hatchery					
		100,590	fry	Boulder Creek					
		349,650	fry	Crooked River					
		200,158	fry	Eldorado Creek					
		55,123	fry	Hopeful Creek					
		144,443	fry	Crooked Fork Creek					
		70,282	fry	White Sand Creek					
		49,437	fry	Ten Mile Creek					
		102,282	fry	Newsome Creek					
		115,352	fry	Brushy Fork Creek					
		1986	10,673,138	2,368,400	eggs	Dworshak NFH	2,630,200	Rapid River	19.0
				712,905	eggs	Sawtooth Hatchery	400,600	Snake River	19.8
				348,600	fry	Crooked Fork Creek			
202,400	fry			White Sand Creek					
98,000	fry			Big Flat Creek					
1987	5,656,145	238,900	fry	Red River Pond					
		30,000	fry	Little Salmon River	2,319,500	Rapid River	22.0		
		103,800	fry	Lolo Creek	500,000	Snake River	20.5		
		137,800	fry	Eldorado Creek					
		62,200	fry	Crooked Fork Creek					
		108,300	fry	Hopeful Creek					
		72,200	fry	White Sand Creek					
		19,500	fry	Big Flat Creek					
		113,800	fry	American River					
		112,100	fry	Newsome Creek					
		100,100	fry	Meadow Creek					
		200,100	fry	Crooked River					
		50,100	fry	Red River					
		50,100	fry	Yankee Fork					
		202,000	fry	Brushy Fork					
1988	7,881,379	1,475,677	eggs	Oregon Fish and Game	2,520,400	Rapid River	26.0		
		149,570	fry	Little Salmon River	250,000	Little Salmon	27.8		
		100,278	fry	Ten Mile Creek	551,200	Snake river	30.0		
		149,570	fry	Little Salmon River					
		100,278	fry	Ten Mile Creek					
		101,062	fry	Crooked River					
		100,862	fry	Crooked River					
		100,628	fry	Newsome Creek					
		100,299	fry	Boulder Creek					
		100,342	fry	Boulder Creek					
		100,097	fry	Newsome Creek					
		195,398	fry	Brushy Fork					
		99,919	fry	White Sand Creek					

Appendix 46. (Continued).

Brood year	No. eggs taken	Egg or fry plants and site		Smolt plants and site		Size (fish/lb)
1988		100,148	fry	White Sand Creek		
		99,401	fry	American River		
		51,369	fry	American River		
		39,163	fry	Meadow Creek		
1989	3,925,585	211,509	fry	Crooked River	256,490	Rapid River 24.2
		548,876	fry	Sawtooth Hatchery	100,100	Little Salmon 22.5
					500,500	Snake River 22.5
1990	4,271,103	200,000	eggs	Looking Glass Hatch.	2,615,500	Rapid River 20.3
		403,400	fry	Sawtooth Hatchery	500,500	Snake River 20.3
1991	2,553,218	3,050	fry	Hayden Creek Hatchery	2,060,300	Rapid River 24.7
		10,126	fry	Squaw Creek	200,300	Snake River 26.8
		90,125	fry	White Sand Creek		
1992	4,534,404	92,897	eggs	Dworshak Hatchery	2,547,624	Rapid River 20.4
					380,600	Snake River 20.5
1993	6,404,312	2,176,157	eggs	Clearwater Hatchery	2,786,919	Rapid River 18.5
					499,536	Snake River 19.1
					379,167	Rapid River 16.8
1994	490,249	58,791	eggs	Clearwater Hatchery	85,840	Rapid River 20.5
1995	132,002	16,402	eggs	Clearwater Hatchery	896,170	Rapid River 20.3
1996	1,171,610	168,754	eggs	Clearwater Hatchery	2,847,283	Rapid River 17.9
1997	4,472,573	1,015,496	eggs	Clearwater Hatchery	200,000	Little Salmon 21.8
					300,000	Snake River 21.8
1998	3,409,130	510,848	eggs	Clearwater Hatchery		

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